AUSTRALIAN

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OPERATIONS

Despina Tramoundanis



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Despina Tramoundanis



Air Power Studies Centre RAAF Fairbairn Canberra 1995

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THE AIR POWER STUDIES CENTRE

The Air Power Studies Centre was established by the Royal Australian Air Force at its Fairbairn Base in August 1989 at the direction of the Chief of the Air Staff. Its function is to promote a greater understanding of the proper application of air power within the Australian Defence Force and in the wider community. This is being achieved through a variety of methods including development and revision of indigenous doctrine, the incorporation of that doctrine into all levels of RAAF training, and increasing the level of air power awareness across the broadest possible spectrum. Comment on this publication or enquiry on any air power related topic is welcome and should be forwarded to:

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DISCLAIMER

The views expressed herein are those of the author and do not necessarily reflect the official policy or position of the Department of Defence, the Royal Australian Air Force or the Government of Australia. This document is approved for public release.

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Despina Tramoundanis Canberra April 1995

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ABBREVIATIONS

1 1

1SQN	No 1 Squadron, RAAF
6SQN	No 6 Squadron, RAAF
82WG	No 82 Wing, RAAF
AA	Anti Aircraft
AAA	Anti Aircraft Artillery
AAF	Allied Air Forces
ACAUST	Air Commander Australia
ACE	Airborne Control Element
ACOPS	Assistant Chief of the Defence Force (Operations)
ACTS	Air Corps Tactical School
ADF	Australian Defence Force
ADFP	Australian Defence Force Publication
AFFE	Army Forces, Far East Command
AFV	Australian Force Vietnam
AHQ	Air Headquarters
ALG	Air Lift Group
AMO	Aircraft Manuals Officer
AOC	Air Operations Centre
APEC	Asia Pacific Economic Cooperation
ASEAN	Association of South East Asian Nations
ASMA	Air Staff Management Aid
ATD	Air Tasking Directive
ATO	Air Tasking Order
BDA	Bomb (or Battle) Damage Assessment
BMG	Battle Management Group
$C^{4}I$	Command, Control, Communications, Computers and
	Intelligence
CAFMS	Computer Aided Force Management System
CDF	Chief of the Defence Force
CDR SRG	Commander Strike Reconnaissance Group
CDR TFG	Commander Tactical Fighter Group
CENTAF	US Air Forces Central Command
CENTCOM	US Central Command
CG	Commanding General

CG FEAF	Commanding General Far East Air Forces
CINC	Commander in Chief
CINCCENT	Commander in Chief Central Command
CINCFE	Commander in Chief Far East Command
CINCPAC	Commander in Chief Pacific Command
CJFA	Commander Joint Forces Australia
CNN	Cable News Network
CO	Commanding Officer
COMAFV	Commander Australian Force Vietnam
COMMS	Communications
COMNAVFE	Commander Naval Forces Far East Command
COMNORCOM	Commander Northern Command
COPS	Chief of Operations (AHQ)
CPD	Chief of the Defence Force Preparedness Directive
CPX	Command Post Exercise
CSPT	Chief of Support (AHQ)
CTAPS	Contingency TACS Automated Planning System
DCA	Defensive Counter Air
DCINC	Deputy Commander in Chief
DEF OPS	Defensive Operations
DJFACC	Deputy Joint Force Air Component Commander
DMPI	Desired Mean Point of Impact
DSTO	Defence Science and Technology Organisation
EXCON	Exercise Control
FEAF	Far East Air Forces
FEG	Force Element Group
FEGCDR	Force Element Group Commander
HQ	Headquarters
HQ1Div	Headquarters 1 Division, Australian Army
HQADF	Headquarters Australian Defence Force
IAF	Israeli Air Force
IDF	Israeli Defence Force
IFF	Identification Friend or Foe
INTEL	Intelligence
JC	Joint Commander
JCS	Joint Chiefs of Staff
JFACC	Joint Force Air Component Commander
JFC	Joint Force Commander
JOC	Joint Operations Centre
JOSAG	Joint Offensive Support Advisory Group

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JRCC	Joint Rescue Control Centre
JTCB	Joint Target Coordination Board
LOAC	Law of Armed Conflict
MAAG	Military Assistance Advisory Group
MACV	Military Assistance Command Vietnam
MPG	Maritime Patrol Group
NATO	North Atlantic Treaty Organisation
NAVFE	Naval Forces Far East
NAVFORV	Naval Forces Vietnam
NKPA	North Korean Peoples Army
NLW	Non-Lethal Weapon
NORCOM	Northern Command
NSC	National Security Council (US)
OC82WG	Officer Commanding No 82 Wing
OCA	Offensive Counter Air
OETC	Officer External Training Course
OFF OPS	Offensive Operations
OPCON	Operational Control
OPS	Operations
PACAF	Air Forces Pacific Command
PACFLT	Pacific Command Fleet
PGM	Precision Guided Munition
PRPP	Photographic/Reconnaissance Policy and Plans
RAAF	Royal Australian Air Force
RAF	Royal Air Force
RAN	Royal Australian Navy
ROE	Rules of Engagement
SAM	Surface to Air Missile
SEAD	Suppression of Enemy Air Defences
SEC DEF	Secretary of Defense (US)
SOINT	Staff Officer Intelligence
SOPP	Staff Officer Policy and Plans
SRG	Strike Reconnaissance Group
SWPA	South West Pacific Area
TACS	Theatre Air Control System
TF	Task Force
TFG	Tactical Fighter Group
TSB	Target Selection Board
UN	United Nations
UNPROFOR	United Nations Protection Force (Former Yugoslavia)

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US	United States
USAAF	United States Army Air Forces
USAF	United States Air Force
VCDF	Vice Chief of the Defence Force
XO	Executive Officer

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GLOSSARY

Air Interdiction the application of air power against enemy lines of communication, to cut and disrupt the flow of resupply and support assets (AAP 1000, p 68)

Air Superiority control of the air that is limited in time, space or both

Air Supremacy absolute domination of the air

Allocation the translation of the Joint Force Commander's apportionment decision into total numbers of sorties by aircraft type available for each task

Apportionment the determination and assignment of the total expected effort by percentage and/or by priority that should be devoted to the various air operations and/or geographic areas for a given period of time

Campaign a controlled series of simultaneous or sequential operations designed to achieve an operational commander's objective, normally within a given time or space (ADFP 1, Glossary)

Combined Forces forces comprised of elements from more than one country

Combined operations involving combined forces

Operations

Deconfliction the process of examining all planned air operations with a view to identifying and eliminating excessive tasking of or demand for limited resources, ensuring safe use of air space, and assuring that planned actions will not adversely interfere with one another

Interoperability the ability of systems, units or forces to provide services to and accept services from other systems, units or forces; to use the services so exchanged to enable them to operate effectively together (ADFP 1, Glossary) Joint Forces forces comprised of elements from more than one service of the same nation

Joint Operations operations involving joint forces

Limited War armed conflict, short of general war, confined to a single theatre of operation involving the overt engagement of the forces of two or more nations

Militarythe logical process of reasoning by which aAppreciation (or
Commander'scommander considers all the circumstances affecting
the military situation and arrives at a decision as to
the course of action to be taken in order to accomplish
his mission (ADFP 1, Glossary)

- Military Doctrine the fundamental philosophy concerning the employment of a defence force. While doctrine is authoritative it requires judgement in its use (AAP 1000, p 27)
- Non-Lethalthose designed to disable, dazzle or incapacitateWeaponssystems or personnel to prevent their normal function
- Operational Art the art of planning and conducting campaigns

Operational the authority delegated to a commander to direct Control forces assigned so that the commander may accomplish specific missions or tasks which are usually limited by function, time or location (ADFP 1, p 7-9)

Preparedness the ability of forces to undertake operations in a timely manner and sustain the activity involved in those operations (ADFP 4, Glossary)

Readiness the ability of designated forces to be committed to conduct specified operational roles and tasks within a nominated time at specific strengths and capabilities (ADFP 4, Glossary)

- Sustainability the ability to support forces on operations (ADFP 4, Glossary)
- Tactical Control the detailed, and usually local, direction and control of movements or manoeuvres necessary to accomplish missions or tasks assigned (ADFP 1, p 7-10)

the rate of activity in war, related to the speed of decision-making and execution as well as to the rate of actual operational activities

Weaponeering

Tempo

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the process of matching weapons to targets carried out as part of the weapon selection procedure

CHAPTER ONE

INTRODUCTION

The operational level of war is where national strategic goals are translated into military objectives and where plans are developed on where, when, and how to prosecute a war. War at the operational level is an orchestration of campaigns and operations in an effort to achieve the desired end state, that is, 'the military conditions that must be attained to support the national strategic goals'.¹ The planning outcomes at the operational level of war comprise the establishment of operational priorities, the identification of targets, and the allocation and apportionment of combat forces. This level of war is not adequately covered by Australian military doctrine.² The absence of such doctrine could be explained by the paucity of Australian command experience at the operational level.

The dearth of such command experience is due (at least in part) to the circumstances surrounding the origins of the Australian military forces and their past employment in war. From the time of British settlement up to World War II there was an expectation by Australian Governments that Britain would provide for the defence of the Australian colonies, in the first instance, and later the dominion. To that end British forces were at first stationed in Australia and later the colonial government sought to provide for Australia's naval defence by paying subsidies to the Royal Navy. Even when separate Australian services were raised, the presumption was that they would fight as adjuncts of their Imperial sister services. This was the case in the First and Second World Wars. Indeed, even after the Second World War a significant proportion of high command appointments in the three Australian services were occupied by British officers or Australian officers trained in British

Australian Defence Force Publication 9 (ADFP 9), *Joint Operations Joint Planning*, Glossary. (This publication is classified Restricted.)

Work is currently under way on ADFP 6 - *Operations* and should go someway toward filling the void.

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military institutions. These officers imported into the Australian military the organisation, tactics, culture, tradition and, in so far as it existed, the doctrine of British forces.

The Second World War brought a change in that it marked the beginning of Australia's military alliance with the United States. During the Second World War and the period immediately following, the United States gradually supplanted Britain as Australia's major ally. In the 1960s and 1970s the Australian military force structure was greatly influenced by the need for interoperability with the United States. Consequently, the Australian military's organisation, tactics and weaponry has shown a strong US flavour. Australia's dependent stance was not greatly affected by this change. During and after the Second World War the presumption persisted that the Australian forces would serve alongside those of their allies as part of a combined force, and would be under the control of the predominant ally.

These circumstances limited the opportunities for Australian commanders to function at the operational level of war. Certainly, this was the case for the RAAF. Despite the RAAF's contributing some 27 000 men to the European theatre during World War II, there were 'no formal command arrangements to keep RAAF units wholly Australian and under Australian command'. On the other hand, the Canadians 'insisted on having their own group' commanded by a Canadian.³

In the South West Pacific Area (SWPA) in 1945, the command arrangements under which RAAF units operated were a departure from those in effect in the European theatre. In the SWPA, RAAF operational squadrons were placed under the control of the Allied Air Forces (AAF) commanded by Major General George C. Kenney, but they were also formed for a period into a discrete component of the AAF. Collectively named RAAF Command, the RAAF squadrons were commanded by an Australian, Air Vice-Marshal Bostock.⁴ The arrangement afforded Bostock the rare opportunity, possibly the only one experienced by a RAAF officer, to function as an operational level commander.

³ Comments by Dr Alan Stephens made during discussion at the 1992 RAAF History Conference, see Australia's Air Chiefs: The Proceedings of the 1992 RAAF History Conference, RAAF Air Power Studies Centre, Canberra, December 1992, p 14.

Stephens, A., 'The Office of the Chief of Air Staff', Ibid, pp 7-8.

Introduction

In 1945, General Kenney delegated 'complete responsibility for all air operations south of the Philippines to RAAF Command with Bostock exercising operational control over all AAF units in the area'.⁵ In this role Bostock became responsible for planning and directing air operations during the OBOE series of operations launched against the Japanese forces that were occupying the former British and Dutch territories.⁶ For the conduct of these air operations, Bostock had available to him the First Tactical Air Force (RAAF) and the USAAF Thirteenth and Fifth Air Forces, as well as RAAF heavy bomber squadrons based in Australia.⁷

Unfortunately, despite the good opinion that Kenney and MacArthur had of Bostock, this precedent did not create further opportunities for RAAF officers to exercise command at the operational level of war.⁸ On the contrary, the RAAF had cause to complain that it was being relegated to mopping-up operations." The RAAF's cause was not aided by the unfortunate command arrangements put in place by the Government which divided command of the RAAF between the Chief of the Air Staff, Air Vice Marshal Jones and Air Vice Marshal Bostock commanding RAAF Command. As is well known, Bostock and Jones did not choose to put the interests of their service ahead of their own and carried on an acrimonious dispute for several years.¹⁰ The Bostock-Jones feud was disgracefully allowed to persist unresolved throughout the war years by a Government that seemed unprepared or unwilling to act. If nothing else, this situation was not one which would have generated the greatest confidence within the Allied Headquarters and did not create an environment conducive to the RAAF making a strong case for a greater role in offensive operations.¹¹

⁸ Stephens, A., 'RAAF Operational Commanders', *Op cit*, p 44.

⁹ *Ibid*, p 22. See also Odgers, G., *Op cit*, p 130.

¹⁰ Stephens, A., 'RAAF Operational Commanders', *Op cit*, p 44.

Loc cit.

Stephens, A., 'RAAF Operational Commanders', *The RAAF in the SWPA 1942-1945: The Proceedings of the 1993 RAAF History Conference*, RAAF Air Power Studies Centre, Canberra, November 1993, p 44.

⁶ Loc cit. See also Odgers, G., Air War Against Japan 1943-1945, Australian War Memorial, Canberra, 1957, pp 451-452.

⁷ *Ibid*, p 452.

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While Bostock's departure from the RAAF at the end of the war helped ease the command tensions, the continuation of the forward defence policy ensured that the force structure and organisation of Australia's defence force would continue to be based on the presumption that it would fight as part of a larger combined force rather than as an independent joint force. Consequently, the Australian forces which took part in the Korean and Vietnam Wars fought as adjuncts of United States force elements and not as a unified force.

The command relationships under which the three components (army, navy and air force) of Australian Force Vietnam (AFV) fought clearly show the non-unified nature of the AFV. While command of all AFV units and personnel was vested in an Australian officer nominated Commander. Australian Force Vietnam (COMAFV), COMAFV was required to be responsive to, and under the operational control of the Commander, United States Military Assistance Command Vietnam'.¹² Moreover, the AFV components were subsumed within various United States force elements. The Australian Task Force (army component) was placed under the operational control of the United States II Field Force Commander.¹³ The RAAF's No 9 Squadron was placed under the operational control of the Commander, Australian Task Force while No 2 and No 85 Squadrons were placed under the operational control of the Commander of the United States Seventh Air Force.¹⁴ The RAN clearance Diving Team was under the operational control of various US Navy commanders and the RAN Helicopter Flight Vietnam was attached to a United States Army Assault Helicopter Company.¹⁵ Clearly with such a dispersal of Australian forces there was little, if any, opportunity for Australian military commanders in general, and RAAF commanders in particular, and their staffs to function at the operational level of war.

In the 1970s, Australian defence policy took a new direction. The long era of forward defence came to a close and the new concept of

¹³ Ibid.

¹⁴ Ibid.

Ibid.

¹² Military Working Arrangement Between Commander, United States Military Assistance Command Vietnam and Chairman, Chiefs of Staff Committee Australia Dated 30 November 1967. Quoted in Horner, D.M., Australian Higher Command in the Vietnam War, Canberra Papers on Strategy and Defence, No 40, The Strategic and Defence Studies Centre, The Australian National University, Canberra, 1986, Annex C.

defence self-reliance emerged in the political and military spheres. To a large extent this change owed its origins to changes in the defence policies of the United States and the United Kingdom which were announced in the late 1960s.

In 1967 the British government, reacting to its own balance of payments problems, announced the impending withdrawal of all British forces from east of the Suez. The withdrawal was planned to be completed by 1971. In July 1969, just two years after the British east of Suez policy was announced, President Nixon speaking at a press conference in Guam enunciated a policy that came to be known as the Guam Doctrine. This policy arose out of a determination not to allow the United States to be drawn into a repeat of the Vietnam experience. Nixon's Guam Doctrine, therefore, required United States' allies and security clients in Asia and the Pacific to accept more of the burden of providing for their own security, promising military assistance only in the event of direct attack by a nuclear power. In all other circumstances, Asia-Pacific countries were to rely primarily on their own armed forces.

The virtual disappearance east of Suez of British military power and the pronouncement of limited commitment by the United States together with the planned run down of resident American forces in South-East Asia formed the backdrop to the Tange review of 1972.¹⁶ The Tange Committee undertook a review of the Department of Defence with Tange recognising that Australia was:

'in an historical transition towards a defence policy in which the structure of the Defence Force, and in which our contingency planning for deployment of the Force, are related more specifically than in the past to the defence of this country rather than to contributing to Australian expeditionary forces [which] usually served under major allies in international collective security where the interests of those allies were predominantly involved ...¹⁷

Responding to this new security environment, the Whitlam government decided to streamline defence management by implementing the Tange review recommendation which called for the integration of the five departments associated with Defence into a single Department of

¹⁶ At the time of this review, Sir Arthur Tange was the Secretary of the Department of Defence.

Tange, Sir Arthur, 'Defence Policy Making in Australia', in Australia's Defence, Birman, J. (Ed), Extension Service The University of Western Australia, 1976, pp 3-9.

Defence, headed by one minister aided by a junior minister.¹⁸ This reflected the changes previously recommended by the Morshead Committee in 1958, which the Menzies Government had chosen not to implement.

Following the Tange review, the 1976 Defence White Paper introduced the concept of defence self reliance into the Australian military lexicon and the need to plan for the possibility of independent operations. The process begun by the Tange review and the 1976 White Paper was continued by the 1987 White Paper where the policy of *defence self reliance within a network of alliances* was formally adopted.

The Tange review was followed by a series of other reviews of the Defence organisational structure which progressively instituted the joint force philosophy into the Australian Defence Force (ADF). This was evident in the creation of joint organisations and a new emphasis on the conduct of joint operations. The organisational changes included the creation of the three 'environmental' commands, the establishment of the ioint force headquarters. Northern Command, the centralisation of policy development in an augmented Headquarters Australian Defence Force (HQADF) manned by an integrated joint staff, and, more recently, in the creation of the HQADF Operations Division under an Assistant Chief of the Defence Force (Operations) (ACOPS). The latter is charged with assisting the Chief of the Defence Force (CDF) in discharging his command functions relating to military operations and plans, training, logistics, intelligence, command support systems and communications electronics. Therefore, at the strategic level there is a strong joint focus.

At the 'environmental' command level this focus is less evident because these commands continue to be manned essentially by single service staff with a single liaison officer from each of the other services. A case in point is Army 1 Division Headquarters (HQ1Div) which is designated the ADF's deployable joint force headquarters. Although when activated as a joint headquarters HQ1Div would be augmented by joint staff, when not so activated it is predominantly manned by army staff.

The development of joint doctrine has lagged behind the organisational changes discussed earlier and has post-dated the development of doctrine by the single services. Joint doctrine for planning

Before the Tange review, defence management was split among five departments comprising: the Department of Defence, the three service ministries and the a Department called Defence Support or Supply at different times.

Introduction

at the strategic level has now been promulgated.¹⁹ However, joint doctrine does not exist for the planning and conduct of war at the operational level. The filling of this void is beyond the scope of the present work and must be left to others, although it may be filled by work currently being undertaken by the staff of the current Commander Joint Forces Australia (Designate), Lieutenant General Sanderson. The ADF Warfare Centre will also contribute to the production of doctrine for the operational level by developing ADFP 6 - *Operations*.

The aim of this monograph is to develop guiding principles for planning the employment of air power in Australian joint operations. Consequently, the ensuing discussion will focus on the functions of the Air Commander and his staff. However, because air plans are not created in a vacuum but comprise a subordinate element of theatre-level campaign plans, the inter-relationships between air planning and campaign development will be discussed. Moreover, broader aspects which impinge on the air planning process will also be examined. Such aspects include force structure, organisation, command and control arrangements and training.

The approach adopted is first, to draw a distinction between the various levels of war, discuss the functional differences between commanders operating at each of the levels of war, and how doctrine at the operational level relates to doctrine and procedures at the strategic and tactical levels of war. Next, there is an evaluation of lessons learnt from past air operations which have influenced the evolution of the operational art.²⁰ Particular attention is paid to campaign planning and execution, command and control of air power, preparedness (readiness and sustainability) and logistics, force structure, apportionment of air effort, and organisation.

This leads onto a survey of the current state of the operational art. A comparison is made between the current operational level doctrine and practice for the application of air power in the ADF and that of other defence forces. Finally, there is a discussion of factors affecting the future of ADF air power and the development of the operational art as it applies to the employment of air power. This discussion is placed in the context of the Australian strategic environment and the strategic guidance provided to the ADF. The implications for future directions in the

²⁰ **Operational art** refers to the art of planning and conducting military campaigns. This term is discussed in detail in Chapter 3.

¹⁹ ADFP 9, *Op cit.*

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organisation, force structure, command and control arrangements, training, and operational exercises are also discussed.

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CHAPTER TWO

COMMAND RESPONSIBILITIES IN WAR

The Nature of War

Most nations generally decry war and claim to be peace-loving. Undeniably, though, history shows that war is a common method of resolving conflict. Currently there are many conflicts in progress in various parts of the world, each with its own characteristic origins and levels of violence. The only common elements between these conflicts is that they all involve force or the threat of force, and that diplomatic activity is closely interwoven in the conflict resolution process both before and after hostilities commence.

A state of war, then, exists whenever one nation (or other organised group) uses or threatens to use force against another which responds in a similar manner.¹ It is irrelevant whether or not the two parties to the conflict have declared war, indeed, it is equally irrelevant whether or not they admit to being at war. War exists whenever there is a reciprocal use of force or reciprocal threats to use force. The actual amount of force employed by each side does not determine whether a state of war obtains, it merely defines the intensity of conflict.

In war, the military defeat of an opponent is not an end unto itself. Warfare, whether adopted as a first or last recourse, has the objective of producing an end-state which each belligerent hopes will serve his interests. Even though this end-state may be defined in terms of the military conditions which must be attained for the conclusion of hostilities, it is only an intermediate objective. The actual reason for going to war is to create a *state of peace* where some or all of the strategic

The term 'war', as it used here, encompasses all armed conflict ranging from general war to insurgencies. Elsewhere the latter form of armed conflict has been termed 'operations short of war'.

objectives of either one or another of the belligerents will be achieved. Hence, the ultimate goal of warfare is a *political* one and the military aims are subordinate to the national political objectives. Therefore, warfare has both a military and a political perspective and is simultaneously fought in both the political and military spheres.

This duality in the nature of war serves to make it a complex, unpredictable undertaking, the mechanics of which do not proceed in accordance with any set rules or procedures. Rather, war is a chaotic interaction of numerous, often conflicting dynamics. Even though the phenomenon of war has been documented and studied for many centuries, its very essence defies analysis. For this reason students of war, such as Clausewitz, describe the conduct of war as being characterised by confusion and chance which 'create a fog of greater or lesser uncertainty'.² Adding to the complexity is the 'friction of war [which] encompasses those countless factors and incidents, at times minor in isolation, that singularly and collectively tend to reduce the effectiveness and overall efficiency of military efforts'.³

The Levels of War

However, while by its very nature war defies definition, past experience in fighting wars enables analysis of the *activities* involved in the conduct of war. Modern theory divides these activities into levels which relate to the functions and responsibilities of command in war. Three levels of war are usually defined: the strategic, operational and tactical levels. In this construct of war, the strategic level represents the highest tier of command comprising the national leadership and the highest echelons of military command. The operational level of war is concerned with the planning and conduct of military campaigns. At the tactical level, individual missions and tasks are planned and executed.

In order to distinguish between the political tier of command and the highest tier of military command, the strategic level is occasionally further divided into the grand strategic and strategic (sometimes called

² Clausewitz, C. von, *On War*, ed. and trans. Howard, M. and Paret, P., Princeton University Press, 1984, p 101.

³ Mackenzie, S.A., *Strategic Air Power Doctrine for Small Air* Forces, Air Power Studies Centre, RAAF, Canberra, 1994, p 48. The term 'friction' was coined by Clausewitz. See Clausewitz, C. von, *Op cit*, pp 119-121.

military strategic) levels. In this four-tiered construct of war, the political leadership functions at the grand strategic level, while the military leadership operates at the military strategic level.

Following the former convention, the Australian Defence Force joint doctrine publication, ADFP 1, while not specifically providing a theoretical construct of war, does define three levels of war: strategic, operational and tactical in the glossary of terms.⁴ Royal Australian Air Force (RAAF) doctrine defines four levels of war: grand strategic, military strategic, operational and tactical.⁵ The four levels of war convention of is adopted here as it allows a distinction to be made between political and military command functions and responsibilities. This arrangement allows an inherently clearer picture to be presented of the command functions and the inter-relationship between them at each level of war.

Responsibilities and Functions at the Four Levels of War

A schematic representation of the four levels of war is depicted in Figure 1. In this diagram intelligence has been separated from the four levels of war, because intelligence is not an organisation but a function which pervades all activities taking place in war. The intelligence function is performed by both military and civil agencies which disseminate information to all levels of command. Moreover, intelligence agencies may be tasked from all levels. Therefore, much of the information that is passed between the various levels of command has its origins in intelligence assessments.

The grand strategic level of war constitutes the highest tier of command and is the level at which the most fundamental decisions are made. Command responsibility at this level is vested in the political leadership of a country, or coalition of nations. At the grand strategic level decisions are made on: whether or not to go to war; what the political aims of the war are; what military conditions are required to be produced through the use of force; and what alliance/adversary relationships obtain. In addition, the political leadership functioning at the grand strategic level decides which political and military constraints (if any) are

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DI(AF) AAP 1000, *The Air Power Manual*, Second Edition, Royal Australian Air Force, Air Power Studies Centre, Canberra, March 1994, pp 10-11.

Australian Defence Force Publication 1 (ADFP 1) *Doctrine*, Edition 1, 30 November 1993, Glossary, pp xxxvii-xxxix.

to be observed during the war. All these factors constitute the strategic guidance provided to the military strategic level.



In addition, the political leadership determines the forces to be committed to fighting the war and the contribution that other elements of national power will make to the war effort.⁶ The formal arrangements for the participation in war of non-military forms of national power are initiated at the grand strategic level.

While command responsibility at the grand strategic level clearly rests with the political leadership, this responsibility is not

The elements of national power include national policy, economic, social, defence, and science and technology resources. See ADFP 1, *Op Cit*, Annex A to Chapter 1.

exercised without input from the military strategic level. The military input comprises advice on the range of feasible military options and their relative merit and probability of success (given the constraints imposed), the likely response from the enemy, and the reaction of allies. Furthermore, military advice would include an assessment of the military capability of the enemy, the preparedness of the friendly forces, and the required commitment, in terms of numbers and weight of effort, of military and civil resources over the likely period of engagement. An assessment of the requisite rules of engagement and broad law of armed conflict implications would also be provided in the military input to the decision making process at the grand strategic level. During the war this advice would be constantly updated thereby necessitating a close working relationship between the grand strategic and military strategic levels.

The highest tier of military command functions is at the military strategic level of war. This is responsible for translating grand strategy into military strategic guidance. Hence, military strategy is subordinate to, dependent upon, and derived from grand strategy. Given the constraints imposed by the grand strategic level, at the military strategic level of war decisions are made on where and how to fight, the allocation of forces to the war effort and, where more than one theatre of operations is active, the weight of effort to be apportioned to each theatre. Based on grand strategic guidance, conditions may also be imposed on the use of force and on the employment of national power resources made available by the political leadership. Commanders functioning at the military strategic level of war are also responsible for translating political aims into military objectives, including providing a definition of the required end-state, that is, 'the military conditions that must be attained to support the national strategic goals'.⁷

The operational level of war is 'primarily concerned with how to achieve the strategic ends of the war with the forces allotted', while operating within the constraints imposed by strategic guidance.⁸ The function and responsibilities of operational level commanders will be discussed in more detail in the next chapter. Suffice it to say that the operational level of war is where strategic guidance is translated into tactical objectives and where plans are drawn up for the employment of available forces in the conduct of operations. The outcomes of this planning process constitute tactical objectives and tasks which are

ADFP 9, Op Cit, Glossary.

Warden, J.A., *The Air Campaign: Planning for Combat*, National Defence University Press, Washington DC, 1988, p 4.

assigned to tactical level commanders, together with the appropriate support from other force elements.

In generating campaign plans and individual tasks, the operational level interacts with both the tactical and military strategic levels. Tactical level commanders review their assigned tasks and the constraints of time, space, force level, and combat and support resources. Where tactical commanders foresee problems or shortcomings they are free to refer these to the operational commander for resolution. Where necessary, these issues are referred up the chain of command to the military strategic and grand strategic levels. This is vital if deviation from the strategic guidance is considered necessary, as for example where uncommitted forces are requested or where a change in the rules of engagement is deemed necessary.

The tactical level of war is where the campaign plans developed at the operational level are executed. This involves 'the planning and conduct of battle ...to gain [the] objectives' applicable to the missions and tasks specified by operational level commanders.⁹

The four levels of war are not discreet centres of activity; there is extensive interaction between them. As communications and information transfer improve, the ease and rate of interaction between commanders operating at the various levels of war increases. Moreover, technological development has increased the reach and impact of military power. At the time of Clausewitz and earlier, war was perceived as a contest between opposing military forces. By contrast, modern war is conducted simultaneously on multiple levels: as a result, activities at one level influence those at the other levels of war. Consequently, the need for coordination and integration between activities at the four levels of war is increased. The operational level of war plays the pivotal role of coordinating and integrating tactical activities with those conducted at the strategic level.

ADFP 1, Op Cit, p xxxix.

CHAPTER THREE

THE OPERATIONAL COMMANDER'S ROLE

The Origins of Operational Level Command

The operational level of war as a distinct concept is a relatively recent addition to the theory of warfare. The term does not appear either in the writings of Sun Tzu or those of Jomini and Clausewitz. However, Clausewitz in discussing the elements of strategy includes the function of 'coordinating ... [several engagements] ... for the purpose of furthering the object of the war'.¹ In modern theory this coordinating function fits within the province of the operational level commander.

The need for the coordinating function became evident as the size and variety of forces employed in battle, the size of the theatre of war, and the number and intricacy of operations increased markedly during the late eighteenth and early nineteenth centuries. Previous campaigns generally involved relatively small armies operating in narrowly defined battlefields. Napoleon's landmark campaigns redefined the size of armies that may be engaged in battle, and also the size of the battlefield itself.² For instance, in the Ulm campaign of 1805, Napoleon amassed a force of 200 000 troops which in the initial stages were drawn up on a 200-kilometre front.³ In his 1812 campaign Napoleon's army formed on a 400-kilometre front.⁴

⁴ Loc cit.

¹ Clausewitz, C. von., *Op Cit*, p 128.

² Macgregor, D.A., 'Future Battle: The Merging Levels of War', *Parameters*, Winter 1992-93, pp 33-47.

³ Strachan, H., European Armies and the Conduct of War, George Allen & Unwin, London, 1983, p 43.

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As both head of state and army commander-in-chief, Napoleon was well placed to translate national strategic goals into military objectives and then impose his own particular campaign style on the conduct of war.⁵ Napoleon's ideal in war was the decisive battle predicated on massive, rapidly manoeuvring armies. In the Ulm campaign, his army manoeuvred over 500 kilometres in a wide envelopment to converge at the rear of the Austrian forces. The manoeuvre took seven weeks to complete and in its conduct Napoleon set new standards in the art of generalship.



Napoleon's mode of warfare was aided by the French army's adoption, in 1799, of the corps system; each corps having 'two to four infantry divisions, a brigade or division of light cavalry and ... [also] ... its own artillery, engineers and train'.⁶ The corps was, therefore, capable of independent operations but was required to function as part of an

⁵ Loc cit.

⁶ Macgregor, D.A., Op cit.
assembled army. Hence, the components of Napoleon's forces formed an interrelated whole.

To best exploit the corps system, Napoleon developed campaign plans based on 'strategically focused, sequential operations and engagements [which] culminated finally in a decisive blow' delivered against the enemy's army. He delegated to 'separate corps-size elements ... independent missions with mutually supporting objectives'.⁷ In essence, Napoleon decentralised the execution of his plan of operations while keeping centralised control of the campaign. The net effect was an accelerated *tempo* of operations and a synergy not previously witnessed.⁸



Count Hebrician bon Moure

Like Napoleon, Helmuth von Moltke (the elder) chief of the Prussian general staff during the period 1857-1888, and a student of Clausewitz, was a great believer in the corps system. Moltke, further developed the practice of operational level command. He introduced the general staff officer corps and the concept of *operational direction* as a means of orchestrating large campaigns while allowing a measure of latitude and flexibility to tactical commanders.

Moltke recognised the importance of flexibility at the tactical level, declaring that 'it is a delusion, when one believes that one can plan an entire campaign and carry out its planned end ... The first battle will determine a new

situation through which much of the original plan will become inapplicable'.⁹ The problem he faced was how to achieve flexibility while maintaining unity of purpose and the integrity of the plan. Moltke's response was to create a small corps (numbering fewer than a hundred) of general staff officers. These officers, having undergone extensive training, were fully conversant with Moltke's intents and concepts of operation and were assigned to act as advisers to tactical commanders (and as

⁷ Ibid.

⁸ **Tempo** may be defined as the rate of activity in war and is related to the speed of decision-making and execution as well as to the rate of actual operational activities.

⁹ Moltke, *Militarische Werke* (Berlin: E.S. Mitler, und Sohn, 1892-1912) Vol II, Part 2, pp 70-117. (Quoted in Krause, M.D., 'Moltke and the Origins of Operational Art', *Military Review*, September 1990, pp 28-44.)

commanders themselves in time). Whenever unexpected situations arose during operations, the general staff officers were in a position to interpret Moltke's operational directions and so maintain the integrity of the campaign plan.

Moltke thus was able to ensure adherence to his plan while divorcing the strategic from the tactical levels of war; thereby ensuring his field commanders did not suffer under undue interference. Moltke himself made it a practice to avoid giving directions of a tactical nature and, despite his extensive exploitation of the telegraph to maintain communications, he warned against too close an interference through imposing 'a telegraph wire in the back of an operational commander'.¹⁰

Both Napoleon and Moltke functioned at more than one level of war. Napoleon was at once head of state and commander-in-chief of the French armed forces. Therefore, he functioned at both the grand strategic and military strategic levels. However, because he also took personal command of his fielded forces, Napoleon was also an operational level commander. Similarly, Moltke exercised command at the military strategic and operational levels of war.

The low tempo, relatively small scale of conflict, and the modest diversity in combat forces prevalent in the eighteenth and nineteenth centuries made it possible for strategic level commanders like Napoleon and Moltke to also direct operations. However, advances in aviation, battlefield mobility, weapons and communications technologies have radically changed the factors of time and space in moderm-day war. Tracked vehicles, aircraft, submarines, missiles, and satellite-based surveillance, reconnaissance and telecommunications have stretched the battlefield to unprecedented proportions and have significantly reduced the time between planning, directing, execution and assessment of operations.

While these advances have enhanced the ability to coordinate effort and to detect and exploit opportunities, they have also drastically increased the span of the operational level commander's responsibility, and the need for coordination. Therefore, even though modern day commanders may and do operate at more than one level of war, the task is now a much more complex and burdensome one than that faced by Napoleon. The size, diversity and manoeuvrability of modern combat forces and the new capabilities to command and control them means that

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Quoted in Krause, M.D., Op cit, p 42.

it is now possible to bring 'globally arrayed forces ... simultaneously against a multitude of widespread enemy targets' in an incredibly complex, multi-dimensional theatre of war.¹¹ The available technology, while aiding the operational level commander, will not assure success in war. Success, as much as ever, depends on the commander's operational art.

Operational Art

Operational art is a phrase borrowed from the Soviet military and is used to describe the conduct of war at the operational level. The essence of operational art is the employment of disparate forces, often *joint* and/or *combined*, to achieve strategic military objectives - while operating within the constraints imposed by strategic guidance.¹² The operational commander's art lies in deciding how to do this task. That is, operational art concerns the planning and conduct of campaigns. Campaigns comprise 'series of simultaneous or sequential operations designed to achieve an operational commander's objective, normally within a given time or space'.¹³ Campaigns may involve massive forces engaged in largescale conflict or, at the other end of the scale, relatively small forces involved in limited war.

Designing the Campaign

As Clausewitz puts it, 'no one starts a war - or rather, no one in his senses ought to do so - without first being clear in his mind what he intends to achieve by that war'. That holds true at each level of war but has particular relevance for the operational commander whose decisions have far-reaching implications for both the troops fighting the war and the broader national interests.

Combined forces are comprised of service elements of two or more countries acting together for the accomplishment of a single mission.

¹³ ADFP 1, Op Cit, p xxxi.

¹¹ Macgregor, D.A., *Op cit*, p 44.

¹² **Joint forces** are forces comprising significant elements of two or more of the armed services of the same country operating under a single commander.

Hence, the first priority for the operational commander is to decide what needs to be achieved by the military means at his disposal. That is, the commander needs to form a clear vision of the shape and characteristics of the military end-state that his campaign is intended to create. The desired military end-state envisioned by the commander forms the basis for selection of the aim and for designing the scheme of the campaign. The commander's vision of the military end-state is derived from the directions given by higher authority and the commander's art, in part, resides in the ability to ensure that his intent for the campaign directly supports, and is designed ultimately to achieve, the objectives of the political leadership.

Therefore, while operational art is primarily concerned with the military aspects of the campaign, the operational commander must not lose sight of the wider political dimensions to the conflict. The political dimension of war has been an important consideration from the earliest times. Clausewitz emphasised that the commander on the one hand, must be 'aware of the entire political situation; [while] on the other he [must know] ... how much he can achieve with the means at his disposal.¹⁴

For the operational commander to fully appreciate the broader issues shaping the setting in which the campaign is to be conducted, he also needs to have an understanding of the national policy, intent, and strategy of his own political leadership and *that of the enemy*. Knowing the intent of his own political leadership will ensure that there is a nexus between any military action that may be taken and the political objectives of the war. Understanding the enemy's intent will help avoid action which supports the enemy's strategy.

The operational commander also needs to have an appreciation of the extant foreign alliance relationships in which the parties to the conflict are involved. Such an appreciation will help the commander to assess the level and nature of support that each party to the conflict is likely to receive from allies and whether particular sensitivities exist in the alliance relationships. The influence of alliance relationships on the selection of courses of action should not be underestimated. In the 1973 Arab-Israeli War, hours before the Arab forces launched their attack, Israel had considered taking pre-emptive action, as it had done in 1967. Indeed the Israeli Air Force had been ordered by the Israeli Defence Force Chief of Staff to prepare for a pre-

Clausewitz, C. von., Op cit, p 112.

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emptive strike.¹⁵ However, the option to carry out a pre-emptive strike was discarded because the Israeli Government was concerned that the United States, a vital source of war-fighting materiel, would not countenance such an act.¹⁶

Other factors that the operational commander needs to take into consideration include the existence of any concurrent, non-military efforts being made to resolve the conflict which could have an effect on the military campaign or which, alternatively, could be affected by it. Such efforts could include diplomatic negotiation, mediation by a third party, or the application of economic pressure. Ill-considered military action could jeopardise these efforts or, alternatively, negate their effectiveness.

Finally, in designing the campaign, the commander needs to be familiar with any sensitivities that may exist within combined forces under his command. In the 1991 Gulf War a disparate coalition of forces with a wide variety of national interests was assembled under a single commander, General H. Norman Schwarzkopf.¹⁷ In designing the campaign plan, Schwarzkopf had to determine the military requirements for the war in light of the sensitivities of the Arab members of the coalition. For instance, the Saudis who had agreed to allow the coalition offensive to be launched from their soil, had expressed a desire to liberate Kuwait.¹⁸ The Syrians, on the other hand, were averse to taking the offensive against their Arab brothers: Iraqi soldiers occupying Kuwait.¹⁹ Accordingly, Schwarzkopf placated the Saudis by arranging for Saudi ground forces to be included in both prongs of the ground offensive into Kuwait. He satisfied the Syrians by tasking them to act as reserves for the

¹⁵ Adan A. (Bren), On the Banks of the Suez: An Israeli General's Personal Account of the Yom Kippur War, Arms and Armour Press, London, 1980, p 80.

¹⁶ Loc cit.

¹⁷ The formal command arrangements were that the non-Arab coalition members were under the command of General Schwarzkopf, while the Arab members of the coalition were commanded by Lieutenant General Prince Khalid bin Sultan al-Saud of Saudi Arabia. Although General Schwarzkopf had final approval authority for all military operations, in the interest of maintaining a smooth working relationship with the Saudis, he agreed to act in consultation with Prince Khalid. See Schwarzkopf, H.N., with Petre, P., *It Doesn't Take a Hero*, Linda Grey Bantam Books, 1992, pp 434-435.

¹⁸ Schwarzkopf, H.N., *Op cit*, p 447.

¹⁹ *Ibid*, p 467.

Egyptians. In this way the Syrians would not need to fight fellow Arabs unless they were coming to the aid of fellow Arab coalition members'.²⁰

There was a further instance where the coalition's campaign plan was adjusted to take into account broader strategic factors. After Iraq initiated Scud attacks against Israel, General Schwarzkopf directed a portion of the air effort (possibly more than he would have liked) to attacking Scud missile launch sites and, indeed, attacking targets specified by Israel.²¹ The reason was that had Israel acted on its threat to conduct retaliatory air strikes against Iraq (and overfly Saudi air space in the process), the fragile coalition of Arab nations supporting the United Nations' cause may have disintegrated. There was genuine concern among coalition members that Saddam's plan to turn the war into an Arab-Israeli conflict might come to fruition.

A further vital consideration in planning campaigns is the bounds of the operational commander's delegated authority. The authority to conduct military operations may be limited in several different ways. For example, the number and nature of forces and other national resources that may be employed will usually be limited except in cases of total war. For example, the use of reserves and the level of call-up will be a consideration, as will the use of special forces. Moreover, the use of civilian resources such as airlines and shipping to support deployment and resupply operations may be restricted in some way. For example, the use of civilian resources may be constrained by a limitation on the funds approved for expenditure.

The timings for military operations and the degree of escalation will be generally limited as well. For instance, during Operation DESERT SHIELD prior to the 1991 Gulf War, the coalition commander was not authorised to initiate hostilities, although he *was* authorised to take action to defend Saudi Arabia. Moreover, the transition to Operation DESERT STORM was not authorised before 16 January 1991 which was the deadline imposed by the United Nations for the Iraqi withdrawal from Kuwait.

Limits may also be imposed on the nature of operations that may be carried out and on the geographical areas, and the air and sea space where forces may be manoeuvred and/or operations may be conducted. An example where such limitations were imposed was the

²¹ *Ibid*, p 485.

²⁰ *Ibid*, p 469.

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Korean War during which the use of nuclear weapons was not permitted and the conduct of operations was limited to the Korean peninsula. Similarly, during the Vietnam War the strategic bombing campaigns were limited in a number of ways; one being that certain areas were designated sanctuaries where bombing was not authorised. Moreover, during the later stages of the war, the American government frequently directed that bombing operations be paused depending on the progress of peace talks.

Guidance on the strategic setting in which military operations will take place, the limits of the commander's authority to conduct operations and the required military end-state would be provided in the form of a directive from the military strategic level. This directive would constitute not only the mission statement but also the authority under which the operational commander is to act. Although such a directive does not have a predefined format, at Figure 1 is a suggested format identifying the key elements that it could be expected to include.

The directive from the military strategic level, therefore, serves three purposes; it informs the operational commander of the situation and the context in which the conflict will be fought, it defines the mission, and it defines the bounds of the authority delegated to the commander including the authorisation to expend funds and utilise national resources. All three of these functions are vital because they define the problem the commander needs to solve, establish the bounds of feasible action and identify the resources available. From this information the operational commander is in a position to evaluate the size of the task ahead by assessing the capabilities and capacity of his own forces versus those of the enemy.

The operational commander's art lies in his ability to assimilate all these inputs and create a scheme for the campaign - called a concept of operations - which is subsequently developed into a campaign plan. The campaign plan will relate how the campaign is to be prosecuted. Specifically, it delineates the sequence of operations designed to bring the desired outcome within the given guidance, and at the least cost of lives and materiel. While the commander is supported by planning staff and technologically advanced aids, Napoleon's assessment that 'many of the decisions faced by the commander-in-chief resemble mathematical problems worthy of the gifts of a *Newton* or an *Euler*' still holds true.²² The reason for the continued complexity of the commanders

Napoleon Bonaparte quoted in Clausewitz, C. von., Op cit, p 112. (Emphasis in the original.)



art is that the size and nature of military forces at his disposal, their inherent complexity and the range of options available to him continue to multiply.

Development of the Campaign Plan

The purpose of a campaign plan is to define the aim of the campaign and to outline the operations which will be used to achieve that aim. In so doing the plan sets out the commander's vision and his intent for the conduct of the campaign. This vision subsequently forms the basis for the conceptual design of the operations which will form part of the campaign and their phasing or sequencing in a manner most likely to achieve the aim. These broad concepts of operations are part of the overall campaign plan; detailed planning for these operations is left to the subordinate commanders tasked with their execution.

Therefore, the first and most important step in the planning process is selection of the aim. After this is done possible alternative ways of achieving the aim may be developed and evaluated before the preferred course of action is identified. The function of the campaign plan is to direct all effort towards achievement of the aim and to ensure that 'there is no expenditure of effort which does not contribute ... to the attainment of the aim'.²³

The campaign plan does not normally remain static throughout the conflict, but, is reviewed and adjusted with changes in the situation, or alterations in directives from higher authority. The plan also needs to be revised whenever the assumptions underpinning it become invalid. Revision of the plan may also be necessary as the battle progresses to either recover from any operational reverses or to exploit opportunities that arise. However, the campaign plan remains a high level document which is underpinned by more detailed supporting plans raised by subordinate commanders to detail the conduct of individual offensive, defensive and supporting operations. These subordinate plans have a much narrower focus in space, time and purpose, while the scope of the campaign plan is theatre-wide giving commanders at all levels an appreciation of the *big picture*.

DI(AF) AAP 1000, Op cit, p 13.

Selection of the Aim

Selection and maintenance of the aim is the pre-eminent principle of war because it is vital to ensure that military power is effectively directed towards the creation of an end-state that leads to the attainment of the required political outcomes. Selection of the aim is the process of translating national policy goals into operational objectives. However, it is possible for there to be a mismatch between what is militarily possible or desirable and what is politically acceptable. This mismatch can arise either because the available military capabilities are not adequate to the task or, alternatively, because political controls on military operations inhibit achievement of the military objectives.

Both Clausewitz and Moltke recognised the potential for conflict between policy and operations. While Clausewitz contended that the objective of war is to achieve a satisfactory political result, he also asserted that 'the first duty and the right of the art of war is to keep policy from demanding things that go against the nature of war'.²⁴ Moltke advanced a more parlous doctrine when he claimed that 'political considerations can be taken into account only as long as they do not make demands that are militarily improper'.²⁵ Although Moltke's position is more extreme than that of Clausewitz, both identify a potential problem that needs to be resolved by commanders. Clearly, both the demands of policy and operations need to be accommodated if an outcome favourable to the national interests is to be attained. Therefore, a balance needs to be struck between political and operational imperatives.

The Vietnam war, prior to the LINEBACKER bombing campaigns, is but one example where this balance was wrong. The central objective of the Johnson administration was to assist the people and Government of Vietnam 'to win their contest against the externally directed and supported communist conspiracy'.²⁶ This policy was subsequently further refined to one of seeking 'an independent non-

²⁶ United States National Security Action Memorandum (NSAM) 273, 26 November 1963. Quoted in Clodfelter, M., The Limits of Air Power: the American Bombing of North Vietnam, The Free Press, New York, 1989, p40-42.

²⁴ Clausewitz, C. von., *Op cit*, p 369.

²⁵ Quoted in Rothenberg, G.E., 'Moltke, Schliefen and the Doctrine of Strategic Envelopment', in Paret, P., *Makers of Modern Strategy: from Machiavelli to the Nuclear Age*, Princeton University Press, New Jersey, 1986, p 298.

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communist South Vietnam' with a stable government.²⁷ Yet concerns over provoking China and the Soviet Union, and thereby escalating the conflict, prompted American policy makers to constrain the application of military force to the point of emasculation.

Hence, the early direction of Defense Secretary McNamara to the Joint Chiefs of Staff to develop a program of 'graduated military pressure' resulted in the ill-conceived ROLLING THUNDER strategic bombing campaign. This campaign was greatly hampered by the farcical situation where the President personally selected the targets to be bombed and by the frequent pauses in the bombing to the extent that there was little effect on a wily and determined enemy. Despite 'a million sorties ... flown and three quarters of a million tons of bombs dropped', in late January 1968, the Vietcong with substantial North Vietnamese support was able to attack 36 out of 44 provincial capitals in South Vietnam.²⁸ This action, which came to be known as the Tet Offensive, caught the United States totally unaware.

The problem faced by American commanders in the Vietnam War was that even though they were charged with fighting a war, they were concurrently encumbered by the requirement to adhere to enervating rules of engagement, bombing pauses, bombing sanctuaries and the need to obtain White House approval for bombing targets.²⁹ Complicating matters further, there was never a clear statement of military aims. 'A post-Vietnam survey of key military leaders who commanded relatively large forces during that conflict revealed many were, at times, unsure of the war's objectives'.³⁰

The Vietnam debacle compares very poorly with the 1991 Gulf War where the President was able to enunciate clear objectives that could readily be translated into military aims. For the latter war, the American

²⁷ NSAM 288, 16 March 1964, Memorandum by Secretary of Defence Robert S. McNamara to the President. Guoted in Clodfelter, M., *Op cit*, p40-42.

²⁸ Tilford, E.H., Setup: What the Air Force Did in Vietnam and Why, Air University Press, Maxwell AFB, June 1991, p 154. (See also pp 149-150).

Record, J., 'Why the Air War Worked', Armed Forces Journal International, April 1991, pp 44-45.

³⁰ United States Department of Defense, Conduct of the Persian Gulf War; Final Report to Congress Pursuant to Title V of the Persian Gulf Conflict Supplemental Authorisation and Personnel Benefits Act of 1991 (Public Law 102-25), Washington, DC, Department of Defense, April 1992, p 33.

national policy objectives and the military mission for the offensive operations were those depicted in Figure $2.^{31}$



The aim must be a clear, unambiguous and concise statement of the military objective to be attained. Moreover, the aim must be achievable and within the capabilities of the available military force. Although it may be stating the obvious, military forces and their resources are finite, and as a consequence the military capability available to a commander is finite both in extent and in endurance. Therefore, the operational aim cannot afford to be open-ended.

An open-ended conflict will ultimately turn into a war of attrition the outcome of which will depend on the endurance of the respective sides. Germany in World War II is a case in point. When it started the war, Germany began with the vague objective of gaining additional territory. After a number of successful campaigns, Hitler continued the offensive with no particular objective except to pursue more

³¹ *Ibid*, pp 19 and 73.

military victories. By contrast Eisenhower's mission for D-Day and subsequent operations was succinct in the extreme, he was directed to undertake operations with the aim of destroying the German armed forces.

Another essential feature of the aim is that its achievement must be measurable. This will enable the success or failure of using military force to be assessed. There are several reason why this is important. For one, the operational commander needs to be able to determine whether or not the campaign plan is succeeding. If the aim is not being achieved, the ability to detect critical failures early will enhance the commander's capacity to recover the situation. If, on the other hand, the aim is being achieved, the ability to demonstrate it to the fighting forces will improve morale and motivation while the ability to demonstrate success to the public will boost national support for the campaign.

In the 1991 Gulf War, achievement of the military aims contained in the CINCCENT mission statement was measurable. The level of destruction of Iraqi forces, their ejection from Kuwait and neutralisation of the Iraqi command authority (through destruction of communications facilities) were demonstrable to some extent. On the other hand, the lack of a specific military aim in the Vietnam War led to the adoption of spurious performance measures being adopted. In the latter war, achievement of war was measured by the tonnage of bombs dropped and the now infamous 'body-count', neither of which provided a true picture of the war's progress.

Selecting the Preferred Course of Action

The contrast between the failures in Vietnam and the dramatic success of the 1991 Gulf War, also demonstrates the importance of establishing a clear causal link between the military course of action and the political objective. The logic underlying the selected course of action needs to be rigorously analysed and tested. That is, the connection between taking a particular military action, the resulting military outcome *and* the way that this outcome will lead to achieving desired political objective needs to be readily demonstrable. If this logic cannot be demonstrated, or is at best tenuous, the military campaign may be nothing more than a futile, enervating exercise which ultimately ends in failure.

The conduct of such an exercise in Vietnam pre-1972 would have shown the futility of making bombardment of the traditional centres of gravity the centre-piece of a campaign against a non-industrialised nation fighting a guerrilla war and receiving the majority of its supplies from external rather than from indigenous sources. Moreover, an analysis such as that proposed here would have shown that frequently pausing the bombing campaign would allow the enemy to recover - as indeed the North Vietnamese did.

Despite the vast manpower and materiel resources expended by the United States in Vietnam, the outcome of these deficiencies was that the American Government finally despaired of ever achieving its original political goal. Eventually this goal was abandoned. In its place a diluted policy of American 'disengagement with honour' was adopted by the Nixon administration.

The conduct of recent UN peace-keeping missions in Somalia and Bosnia are further examples of poorly conceived military operations. The logic behind despatching relatively small forces into volatile areas where they are not permitted to fight and charging them to keep the peace is not immediately evident. This situation is not new. In early 1984 the United States attempted a disastrous peace-keeping mission in the Lebanon where approximately 350 American marines were killed without, apparently, having achieved anything positive in the way of national goals.

The military tool for analysing the situation and for selecting the course of action most likely to achieve the military objectives - and by extension the political goals - is the commander's estimate or 'appreciation of the situation'. The appreciation is a formalised 'logical process of reasoning by which a commander considers all the circumstances affecting the military situation and arrives at a decision as to the courses of action to be taken in order to have the highest probability of accomplishing his mission'.³² Such courses may range from taking preemptive action to defending against enemy aggression.

The Concept of Operations

Once the preferred course of action has been selected, the concept of operations needs to be developed. The concept describes the commander's vision of how the battle will unfold. For instance, in the 1973 October War, the combined Egyptian-Syrian offensive against Israel

³² Australian Defence Force Publication 101 (ADFP 101), Staff Duties Series, *Glossary*, p A-17, 'Appreciation of the Situation'.

was conceived as a two front war thereby exploiting the Israeli weakness of manpower limitations. The tactical superiority of the Israeli Air Force was neutralised utilising an effective air defence network, and mobile manpack anti-tank missile forces were used to counter the Israeli superiority in tank manoeuvre warfare.



A second example is the four-phase campaign plan conceived by General Schwarzkopf for the 1991 Gulf War. As illustrated in Figure 3, the original concept of the plan was that the four phases were to be sequential with some overlap at the transition from one phase to the next.³³ In the event, the first three phases were run almost concurrently with a gradual change in the allocation of air missions to the latter phases as the war wore on. The air campaign itself was extended to make up for lost time due to weather, but the ground offensive lasted just one hundred hours.

³³ The diagrammatic representation of the four-phase campaign of the Gulf War is adapted from Lewis, R.B.H., 'JFACC: Problems Associated with Battlefield Preparation in Desert Storm', *Air Power Journal*, Spring 1994, Figure 1, pp 4-21.

Several factors need to be weighed in selecting the preferred course of action. Among these are included, the comparative military capability and endurance of the opposing forces, their respective vital points and the nature of the environment in which the campaign will be fought. The comparison of forces is made on the basis of preparedness, numerical strength, the state of technological advancement, range of combat capabilities, logistic support, effectiveness of command, control, communications and intelligence, to name but a few characteristics. The purpose of such a comparison is to fully analyse the balance of power, and expose enemy weaknesses and strengths vis a vis those of friendly forces. Such analysis will assist in determining whether the arrayed friendly forces are adequate to the task and assist with developing the concept of operations.

Enemy and friendly vital points are also a crucial factor in developing the concept of operations. Enemy vital points are ones which, if destroyed or damaged, would help achieve the aim. The ability to effectively attack such points, and their vulnerability to attack determines whether such operations are feasible. Own vital points are ones which if destroyed or denied by the enemy would prevent attainment of the aim. The importance of preserving these points, and their vulnerability to enemy attack will guide the decision to defend them and the effort to be expended in their defence.

The theatre environment is important for various reasons. Geography, meteorology and terrain can constrain the conduct of operations and the ability to manoeuvre and resupply and, hence, can provide an advantage to either enemy or friendly forces. For example, air forces with day-night, all-weather capability can operate more freely in poor weather conditions than can ones lacking such a capability. Similarly, a flat, open terrain uncovered by foliage and interrupted by large land formations is more open to air attack than densely covered, mountainous terrain.

An important element of the operational concept is the sequencing of the campaign operations into a logical progression of events, and the allocation of tasks to force elements under command. The sequencing of operations will determine the tempo of operations, the disposition of forces, their manoeuvre and the establishment of logistics support pipelines for the various phases of the campaign.

Care must be taken to ensure the campaign plan is not too rigid, because such a plan needs constant revision. Rather, options should be built into campaign plans which allow for the exploitation of

The Operational Commander's Role

opportunities or for the recovery from reverses as they arise. This helps the operational commander retain the initiative as the battle progresses. It also keeps the enemy in two minds as to what is coming.

The outcome of the campaign planning process should be a series of tasking orders to subordinate commanders who are charged with the accomplishment of the various parts of the plan. These tasking orders will specify each individual mission, the command and control arrangements and the forces available to the commander charged with achieving that mission, the role of the forces under command, the arrangements for administration, and a policy for communications and electronic counter measures.³⁴

Administration applies to all elements which support the combat effort and includes logistics and personnel aspects necessary for efficient support of the operational force.

CHAPTER FOUR

AN OPERATIONAL LEVEL VIEW OF AIR POWER

Defining Air Power

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In the ensuing discussion on the role of air power, a distinction will be made between air power and *air forces*. Use of the term *air power*, originally applied to manned aircraft, preceded Bleriot's historic flight over the English Channel in 1909.¹ However, mainly as a result of technological advances, air power has become a much broader concept than implied by its original usage.

Several 'definitions' have been proposed without any one of them gaining universal acceptance. Common among early definitions was the notion that civil and military air capability comprised a nation's air power. Brigadier General Billy Mitchell rather vaguely described the concept of air power as:

'the ability to do something in or through the air. It consists of transporting all sorts of things by aircraft from one place to another'.²

More recently the emphasis has been on the utilisation of the air medium for military purposes. General Hap Arnold proposed in 1945 that:

'Airpower [sic] includes a nation's ability to deliver cargo, people, destructive missiles, and war-making potential through the air to a desired destination to accomplish a desired purpose'.³

Quoted in Armitage, M.J., and Mason, R.A., Op cit, p 2.

Armitage, M.J., and Mason, R.A., Air Power in the Nuclear Age, 1945-84: Theory and Practice, The MacMillan Press Ltd, 2nd Ed, London, 1985, p.2.

Mitchell, W., Winged Defense: The Development and Possibilities of Modern Air Power - Economic and Military, Dover Publications, 1988, p xii.

The definition currently accepted by the Royal Air Force (RAF) echoes that of the United States Air Force (USAF), although the latter expands the air power concept to encompass operations also in the space environment and has coined the term *aerospace power*.

RAF: 'air power is the ability to use platforms operating in or passing through the air for military purposes'.⁴

USAF: 'acrospace power grows out of the ability to use a platform operating in or passing through the aerospace medium for military purposes'.⁵

In the context adopted by the USAF, the aerospace environment 'consists of the entire expanse above the earth's surface'.⁶

The current RAAF definition is derived from one originally proposed by Armitage and Mason in 1984 but has been adapted to include the space environment:

RAAF: 'air power represents the ability to project military force in the third dimension - which includes the environment of space - by or from a platform above the surface of the earth'.⁷

These three contemporary definitions of air power, have certain elements in common: platforms of various types operating in the aerospace environment exploit this environment for military purposes, or for the projection of military force. The platforms referred to in these definitions could be fixed- or rotary-wing aircraft, manned or unmanned vehicles, balloons, ballistic and cruise missiles and satellites. The military activities that could be performed by these platforms in the aerospace environment include observation, navigation, communication,

⁴ *Royal Air Force Air Power Doctrine*, AP 3000, 2nd Ed, 1993, p 13.

⁵ Air Force Manual 1-1, Volume I, *Basic Aerospace Doctrine of the United States Air Force*, Department of the Air Force, March 1992, Washington DC, p 5.

⁶ Loc cit.

⁷ DI(AF) AAP 1000, *Op cit*, p 31. The Armitage and Mason definition from which the RAAF's definition of air power is derived appears in Armitage, M.J., and Mason, R.A., *Op cit*, p 2.

transportation, and manoeuvre, as well as aerial combat and air-to-surface attack.

Note that air power is defined as *the ability* to exploit the air medium. This ability implies, *inter alia*, the existence of secure, protected air bases and logistics support capability, including maintenance and resupply. The ability to exploit the air medium also hinges upon the availability of accurate surveillance and intelligence, the means to adequately control air movements, and research and development in the broad range of capabilities underpinning national air power. Clearly, not all these capabilities can be, totally maintained within an *air force*. Consequently, national air power entails the contribution of several organisations outside an air force. It is, therefore, logical that none of the three contemporary definitions of air power make reference to which authorities should command the air 'platforms', and who should control the supporting capabilities.

Air Power - A Difficult Birth

While the value of air power has never been in question, the decision of what capabilities are best maintained within a separate *air force* and to what degree its operations should be independent of the surface forces has been a contentious subject ever since the first successful attempts were made at heavier-than-air flight nine decades ago. Since that time, air power has evolved at a dazzlingly rapid rate, so much so that in these few short years the fantastical yet prophetic tales of visionaries such as H.G. Wells to a large extent have been realised. However, as illustrated by the following description of the origins of the Royal Australian Air Force, the process of integrating air elements into the existing military organisations was a tortured one and was often accompanied by a raging debate over the role of air forces versus those of armies and navies.

'The birth of the Royal Australian Air Force in the years immediately following the end of the First World War was not accomplished amid unanimity and general confidence that this was a necessary or even appropriate step. Instead, it was a compromise solution arrived at after three years of constant and often futile debate which was to leave a lasting legacy of bitterness within the Australian defence community ... the decision to form the nation's air defence resources as a single new service, separate from either the Army or the Navy but serving their needs, was both the product and the further cause of interservice rivalry'. $^{\rm 8}$

Similar debates accompanied the creation of the RAF and the USAF, the latter not being formed as a separate service until after World War II. The debate over the employment of air power centred on a choice between two apparently mutually exclusive options; subordinating air elements to the surface forces, or forming separate, independent air services.

While it cannot be denied that doctrinal issues over the selection of the best war-fighting strategy were central to the debate, other issues relating to command of the new air services and control of the respective budgetary allocations were also important considerations. Indeed, it often became difficult to separate out the genuinely military concerns from those of self-interest. Ultimately, though, it did not matter whether or not such a distinction was made because whichever service won the strategy debate was assured of gaining control of the air resources and the respective funding.

The seeds for the debate over the role of air power were sown very early in its development. The question of who would control air resources and budgets was a vital concern for Western military organisations in the interwar period because resources for defence were difficult to acquire. Moreover, while air power had shown much promise and high potential during World War I, the claims of its proponents far outstripped what was technically possible at that time. Notwithstanding the grand visions of Douhet and others, it was only at the end of World War II that some of the claims made by airmen on behalf of air power began to materialise. There were, therefore, no genuine grounds upon which to challenge the common wisdom that armies and navies decide the outcome of wars.

Even today the question of which of the services is the decisive factor in war - and hence which should have funding priority - continues to be the basis of argument and forms the subject of provocative articles appearing, from time to time, in defence journals.⁹ However, apart from providing an interesting diversion, such discussions are of little value

⁸ Coulthard-Clark, C.D. *The Third Brother: The Royal Australian Air Force 1921-39*, Allen & Unwin, in Association with the Royal Australian Air Force, 1991, Canberra, p 1.

For example see Bailey, L.M., 'The Medium Power Airforce - What Need to Exist?', *Defence Force Journal*, No 83, July/August 1990, pp 51-58.

because the underlying premise that one or other of the services can be consistently the decisive factor in war - every war - is flawed. Decisive factors vary depending on the nature of the war, the relative strengths and weaknesses of the belligerents, the degree of alliance support and international interference as well as a host of other political, military, and physical factors. What does not vary is that the victor is the one who best exploits to his own advantage the strengths of his position and the weaknesses in that of the enemy.

The Positive Attributes and Limitations of Air Power

Air power has some unique strengths which make it an invaluable addition to any commander's arsenal. Some of these positive attributes derive from characteristics of the air environment and the nature of air travel. The low level of friction and absence of physical boundaries in the air medium combine to give air power the ability to travel at high speed and achieve extremely long radii of action almost anywhere over the surface of the earth unconstrained by physical barriers. The ability to swiftly cover great distances gives air power the flexibility to divert from one task to another and to perform several tasks within a relatively short time frame. In this way air power can be responsive to multiple requirements whether they be offensive or defensive in nature. Moreover, the high altitudes achievable by air platforms give a unique perspective of the battlefield whether it be for intelligence gathering purposes, surveillance, or for command and control of operations.

There are other positive attributes which are not inherent in the medium in which air power operates but are derived from technological developments. Technology has given air power the ability to deliver a high level of firepower from relatively small numbers of platforms operated by few aircrew. Hence the risk to personnel is minimised relative to the firepower delivered. At the same time, technological advances in the accuracy of delivery and targeting of air delivered weapons reduces the number of sorties needed to service targets and further reduces the personnel risk. Of equal, if not greater, importance is the concurrent reduction of the risk of collateral damage and civilian casualties.

A further positive attribute of air power derived from technological advances is the flexibility in the roles and missions that may be built into single airframes. Multi-role aircraft have the ability to be configured for conducting different roles in successive sorties. Multimission aircraft are capable of performing more than one specialist task during the one sortie.¹⁰ These attributes give commanders added flexibility in the employment of the available air resources.

Air power also has other attributes which detract from its effectiveness.¹¹ These attributes can be segregated into ones which are inherent in the nature of air power and others which are capable of being overcome by technology. An important inherent limitation is that air power, relying as it does on technological developments, is a victim to the dynamic contest between measure and counter-measure as advances are made in weapons systems technologies. Therefore, the ability of air power to dominate the battlefield is a hostage to technology. As a direct consequence, the development of technological change. The Israeli Air Force learned this costly lesson during the 1973 Yom Kippur War when it was surprised with the effectiveness of the Arab forces' air defences.

The dependence on technology has a further undesirable consequence: as more and more technologically advanced air platforms are introduced, the more prone to obsolescence are those already inservice. Hence, a further inherent feature of air power is the high cost of maintaining one's relative technological level in air power capability. This extends beyond the mere acquisition of air assets, requiring also the need to develop and hone operational skills and to carry out effective Doing so is costly in terms of investment in capital maintenance. equipment and spares, in the usage of consumables, and in manpower. In times of stressed defence budgets a difficult trade-off between preparedness levels, the number of air assets, and force structure may be necessary. Technology always comes at a cost, therefore, technological advances are likely to add to this problem rather than alleviate it. The balance that needs to be made is that between the cost of ownership of the weapons system and its effectiveness.

Air power, more than the other forms of military power is dependent on the availability of base support and, for most aircraft types, runways. This dependency can be a significant weakness. Bases vulnerable to enemy attack are vital points that need to be protected thus consuming combat resources. The location of bases can be an equally important limitation. While technology has created an air-to-air refuelling capability to enable aircraft to operate at extended ranges from their home

¹⁰ DI(AF) AAP 1000, *Op cit*, pp 37-38.

¹¹ *Ibid*, pp 39-41, and AP 3000, *Op cit*, pp 14-15.

base, the number of tanker aircraft available, the fuel they can carry and the ranges to which they can operate is finite. Consequently, intensive, long-term operations over extended ranges would not be feasible. The coalition air effort in the Gulf War could not have been as effective had air bases in regional host nations such as Saudi Arabia, Yemen and Turkey not been available for use. Technological improvements in aircraft engines and fuels as well as enhancements in aircraft reliability and maintainability could reduce the dependence on air bases, however, some form of dependence will remain in the foreseeable future.

Despite significant technological advances, air power continues to be affected by operational limitations, namely impermanence, vulnerability to attack, the need to trade-off payload against range, and susceptibility to weather conditions. Air power is unable to maintain a permanent presence for extended periods without an extremely high and costly commitment of resources. Notable exceptions to this are satellites used for surveillance, communications and navigation, and possibly nuclear weapons or defences against ballistic missiles. Impermanence means that the effects of air power operations tend to be transitory often necessitating repeated missions in order to sustain the desired effect. The development of air-to-air refuelling has enabled aircraft to stay airborne for longer periods than was previously the case. However, air power still cannot claim to be able to hold ground in the same way that surface forces can. On the other hand, air power can create benign conditions in which the surface forces can easily capture and hold territory.

While the ability of air power 'platforms' to operate in the air medium is a source of great benefit, it is also a factor which limits the capability and effectiveness of these platforms. The need to maximise thrust-to-weight ratios and to maximise payload and range means that air frames need to be made as light as possible. Hence, the protection that can be built into airframes is extremely limited making air platforms vulnerable to enemy attack both in the air and on the ground. Protective measures for air platforms on the ground include dispersion, camouflage and the construction of hardened shelters. All these protective measures are available at a cost. For airborne platforms protective air escorts can be provided as can self-protection weapons and devices, although both these measures reduce the overall offensive capability either by using up air assets in protective roles or by reducing payload capacity. Other measures that have been developed include improvements to the manoeuvrability of aircraft and an increase in the accuracy and range of air-launched weapons. Through these improvements the air platforms from which such weapons are deployed, and their crews, operate at a reduced risk. The introduction of stealth technology has also improved

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the survivability of aircraft. However, this technology is extremely costly and may be beyond most nations' ability to afford. Moreover, it may only be a matter of time before effective counter-measures are developed.

A further important limitation affecting air power is the need to trade-off payload for range. Air-to-air refuelling has to a large extent overcome this limitation. However, the refuelling tanker fleet can become a weak link either because it is not a large capability to begin with or because it becomes a target for enemy attack. Any protection provided to tanker aircraft must ultimately detract from the offensive capability of the force.

Technological solutions designed to allow aircraft to operate in the dark and in poor weather conditions have been under development since the beginning of powered flight and will continue to be a high priority. However, for the time being weather remains a limiting factor in the employment of air power. Despite the extensive availability of hightech equipment in the 1991 Gulf War, air operations were still disrupted by the worst weather to hit the region in twenty-five years.¹²

Employment of Air Power

Only three air forces, the USAF, RAF and RAAF have published their doctrine. Therefore the following discussion of air doctrine will refer only to these three services. Discussion of the application of air power is complicated because there is no universally agreed terminology. RAF doctrine, for example, defines air power activities and functions in terms of the air power operational hierarchy shown in Figure 1.¹³ While this categorisation of functions is not of itself flawed, the RAF model has the drawback that it uses the term strategy which can have several other connotations and suffers from over-use. Moreover, in defining the term air strategy 'as the overall employment plan for *air forces* in a war', the RAF doctrine does not explicitly link the air strategy to the military objectives of the war and does not make clear whether *air forces* encompasses all national air power assets or only those of the RAF.¹⁴ Consequently, from

Ibid, p 26.

¹² Freedman, L., and Karsh, E., 'How Kuwait was Won', *International Security*, Vol 16, No 2, Fall 1991, p 26.

¹³ AP 3000, *Op cit*, pp 26-29.

the definition of air strategy, it is not immediately clear how the RAF fits into joint operations.



The RAF definition of *air campaign* does explicitly link air operations to the overall theatre-level campaign. RAAF doctrine also includes the concept of air campaigns but shows that these tie-in with the overall war aims. USAF doctrine makes an even clearer connection between air campaigns and overall military objectives.

RAF: An air campaign is 'a coordinated series of air operations designed to achieve a specific air strategic objective.'¹⁵

¹⁵ *Ibid*, p 27.

RAAF: 'In the air power context, a campaign is a series of operations which shares a common objective aligned to the overall conduct of the war'.¹⁶ And elsewhere: 'An air campaign is a controlled series of related air operations aimed at achieving a single, specific, strategic result or objective'.¹⁷

USAF: An air campaign is 'a connected series of operations conducted by air forces to achieve joint force objectives within a given time and area of operations'.¹⁸

However, the RAF and the RAAF create some confusion by also defining three generic air campaigns which, in the case of the RAAF, are Control of the Air. Air Strike and Air Support.¹⁹ This use of the term air campaign is ambiguous and does not sit comfortably with the definitions presented above. In particular, it is difficult to see how, in the case of the RAAF. Air Support could be considered to be a distinct air campaign because it includes a whole raft of activities, in support of all three services, which will not be necessarily directed towards achieving the same 'single, specific, strategic ... objective'. Similarly, several unrelated air strike operations may be directed to achieving a number of different strategic objectives. It would be difficult in that situation to call all air strike operations an Air Strike Campaign. Hence, there may be a need to re-examine the RAAF's usage of the term 'air campaign' as a reference to the three generic functions of air power; Control of the Air, Air Support and Air Strike, and also as a description of specific related air operations which form part of a particular joint campaign.²⁰

²⁰ In their paper, *Operational Level Doctrine: Planning an Air Campaign*, Waters and Stephens find ambiguity in the RAAF's usage of the term 'air campaign' and feel compelled to add an explanatory footnote to explain the context in which they

¹⁶ DI(AF) AAP 1000, *Op cit*, p 41. (Emphasis added.)

¹⁷ The Condensed Air Power Manual, DI(AF) AAP 1001, 2nd Ed, RAAF Air Power Studies Centre, Canberra, 1994, p 10.

¹⁸ Air Force Manual 1-1, Volume II, Basic Aerospace Doctrine of the United States Air Force, Department of the Air Force, March 1992, Washington DC, p 270. (Emphasis added.)

¹⁹ Control of the Air is the campaign in which operations are conducted for the purpose of gaining freedom of action in the air. In Air Strike campaigns, air power is used to attack an enemy's homeland, national interests, resource base and war-making capacity. Air Support campaigns are designed to complement the combat power of land, sea and air power assets and can include both the application of firepower or non-lethal support such as reconnaissance and air lift. See DI(AF) AAP 1000, *Op cit*, pp 41-43.

The RAF doctrine, while postulating a slightly different set of generic air campaigns to those defined by the RAAF, makes the same ambiguous use of the term *air* campaign. By contrast, the USAF avoids any ambiguity by adopting the term 'USAF roles' for the activities corresponding to the RAF/RAAF generic air campaigns. The USAF roles are defined to be 'the broad and enduring purposes for which [the USAF] was established'.²¹



While the USAF roles, and RAF and RAAF air campaigns do not directly correspond to one another, they cover the same ground as

were using this term. See Waters, G, and Stephens, A., *Operational Level Doctrine: Planning an Air Campaign*, Air Power Studies Centre, Paper No 18, October 1993, p 13, footnote 21.

²¹ Air Force Manual 1-1, Volume II, *Op cit*, p 299.

may be seen from Figure 2. The main difference between the three service doctrines is in the role of air support. Under 'air support' the RAAF includes both combat and non-combat support: that is, all activities which complement and enhance the combat power of land, sea and air power assets. The RAF includes all non-combat support air operations under each of its three air campaigns and combines combat support of surface forces under its 'Anti-Surface Force Campaign'. The USAF includes noncombat support activities under the roles of Force Enhancement and Force Support and combines combat support air strike in the role of Force Application.

To further complicate matters, both the RAF and the RAAF use the term 'roles', though not in the same context as the USAF. In the case of the former two services, the term role is used to refer to tacticallevel functions. By contrast, the USAF uses the term roles to refer to the generic functions of air power. Given that there is no consensus in the terminology applicable to the employment of air power, to facilitate the following discussion, the RAAF's usage will be adopted.

In a situation where the enemy has the capacity to use air power, the RAF, USAF and RAAF air power doctrines give priority to gaining control of the air. The level of control sought may be limited in extent, time and space or, alternatively, total air supremacy may be required.²² This is the case because through achieving the desired level of control of the appropriate air space for the required time period, friendly air power ensures its own freedom to operate while denying such a freedom to the enemy. A direct outcome of achieving control of the air is that friendly forces (land, sea and air) are free to operate in an environment relatively free from air threat. In such a benign air environment not only the security but also the effectiveness of friendly Hence, gaining air superiority enhances the forces is enhanced. effectiveness and safety of land, sea and air operations. Therefore, it may be considered to be a preparatory phase for subsequent operations in each of the three environments.

Despite the impermanent effect of air power, the benefit of such a flexible combat capability is that control of the air can be reimposed as the need arises while in the meantime air resources can be diverted to other missions. Moreover, as the campaign progresses and the operational requirements change, the way that the air effort is tasked may

Air supremacy implies absolute domination of the air, whereas **air superiority** connotes control of the air that is limited in time, space or both.

be varied to give more weight to different priorities than those which were established at the beginning of the campaign.

Controversy arises in considering the relative merits of supporting the surface battle versus carrying out air strike operations. The primary difference between these two uses of air power is in the time it takes for the impact of the air effort to be felt in the theatre of operations. When air power is used to support the surface battle in close operations, the impact is felt immediately by the forces engaged in battle.²³ By contrast, the use of air power in deep operations takes longer to have an effect on the conflict, but the impact may be dramatic because it affects the enemy's endurance and effectiveness through its degradation of enemy reinforcements, logistics, computer, command, control, communications and intelligence (C⁴I) capabilities.²⁴

Air strike operations directed against an enemy's homeland, national interests, resource-base, infrastructure, national will and warmaking capacity, generally, do not have an early effect on the battle and their impact is not always clear cut. For instance, the exact impact of the allies' bombing campaign against Germany in World War II is still open to debate given that German production increased and public morale stiffened during the bombing campaign.²⁵

Hence, the issue of air support to the surface forces via close and deep air operations as against the conduct of air strikes is always important and hotly debated. At the operational level, the decision as to where and when air power should be concentrated in order to attain the campaign objectives is critical. That is, a balance must be struck between offensive and defensive air operations, and between pursuing short term and longer term goals.

²³ **Close operations** are those against enemy forces engaged in battle with friendly forces. See FM 100-5 *Operations*, Headquarters, US Department of the Army, Washington DC, 14 June 1993, pp 6-14 and 7-13.

²⁴ **Deep operations** include those against enemy forces not yet engaged in battle and interdiction operations against enemy logistics, C⁴I facilities or air defences. The intention is to destroy, disrupt or divert enemy combat capability and to create or expose vulnerabilities that may be exploited. See FM 100-5, *Op cit*, pp 6-14 and 7-13.

Overy, R.J., The Air War 1939-1945, Papermac, London, 1980, pp 119-126.

Apportionment - The Operational Challenge of Air Power

Air power's prime attribute, its ability to operate free from physical barriers, means that air power is a theatre-wide war-fighting capability. Hence, despite being affected by a number of significant limitations, air power is a vital force-multiplier that has frequently been influential in deciding the outcome of war. When properly injected at crucial times in the battle, air power has the potential to shift the balance of power significantly in favour of the friendly forces.

The correct employment of air power, therefore, becomes an important challenge that the operational commander must face. The challenge lies in finding ways to fully exploit air power's strengths while minimising the effects of its limitations. A most important consideration in this process is deciding how to apportion air effort, where:

'Apportionment is the determination and assignment of the total expected effort by percentage and/or by priority that should be devoted to the various air operations and/or geographic areas for a given period of time'.²⁶

The apportionment decision seeks to ensure that the weight of air effort is distributed in a manner that supports and is consistent with campaign objectives and priorities.

The apportionment of air effort is frequently the main source of contention and has been the root cause of the argument regarding the status of air forces and the employment of air power in war. Because of the costs associated with acquiring, maintaining and operating air platforms, usually there are not enough to satisfy every need. The problem is that each tactical commander perceives the need of his own forces to be of prime importance and is critical if air support is not. forthcoming,

In the past, air commanders have been accused of disregarding the needs of surface forces in the pursuit of their own objectives. Such complaints were not without foundation. In the aftermath of World War II, Western air forces fervently adopted the doctrine of 'deterrence by the threat of strategic nuclear air bombardment which was to dominate air power' thinking and shape force structure for

AP 3000, Op cit, pp 26-29.

several decades.²⁷ Indeed, strategic bombing in many ways became the *raison d'etre* of air forces - at least it was a compelling reason for maintaining independent air forces. Because Western air forces relegated the tactical application of air power to secondary importance, surface forces perceived a need to retain an organic air capability to ensure air support was available to them when required.

The creation of army and naval organic air arms, merely perpetuated the argument between services rather than settling it. Under these arrangements the competition for funds became more intense and was further fuelled by inter-service competition over the air capabilities that each service would maintain. This state of affairs did not promote cooperation between the services and the role of the operational commander became particularly difficult. Unity of effort, particularly as it applied to the employment of air power, was almost impossible to achieve.

Armitage, M.J., and Mason, R.A., Op cit, p 19.

CHAPTER FIVE

COMMAND AND CONTROL OF AIR POWER-LOOKING BACK TO LOOK FORWARD

In war fighting, the ability to learn from the past is particularly important because it provides guidelines for avoiding past mistakes which if repeated have the potential to be costly in terms of human life and national resources. A study of past conflicts provides an insight into the policies and practices that worked or failed in previous wars. From such an insight, lessons may be distilled for the future employment of military forces - not least air forces. Not all 'lessons' from the past have immediate application in the future. Care must be taken to assess the validity of such lessons given subsequent changes in various factors influencing the conduct of warfare. A constantly changing aspect of war and one which is a primary influence in the evolution of military doctrine, is technology.¹ The introduction of major innovations including tracked vehicles, aircraft and submarines, have revolutionised warfare.

Air power has been subject to radical technological change over a remarkably brief period of time. In less than a century, aviation technology has progressed from the Wright Flyer to stealth aircraft and space travel. Over the same period air weapons technology has moved from rudimentary machine guns and free falling bombs to precision guided munitions, nuclear warheads and space-based defence systems. Such improvements in capability constantly challenge previous tenets regarding the most effective use of air power. Yet despite the changes in air power technology witnessed in the past nine decades, a study of past

Military doctrine derives from an analysis of past experiences in war and from innovative thinking. It establishes an officially sanctioned framework for the conduct of armed conflict. The RAAF defines doctrine as 'the fundamental philosophy concerning the employment of a defence force'. - (DI(AF) AAP 1000, *Op cit*, p 27). An alternative source (AP 3000, *Op cit*, p 7) defines military doctrine as 'the *fundamental principles* by which military forces *guide* their actions in support of objectives'. (Emphasis in the original). Both sources make the qualification that although doctrine is authoritative it requires judgement in its use.

conflicts offers some guidance on the command, control and employment of air power.



Command and Control of Air Power - Looking Back to Look Forward

World War I

At the end of World War I air power was still very much in its infancy. While all of the roles that aviation was to fulfil in future conflicts had been developed by the time the war ended, guidance on its use had not been formulated into coherent air power doctrine. The emergence of some guidelines could be discerned in the writings of Douhet, Mitchell and Trenchard, but these writings hardly comprised a cohesive set of ideas.

Even so, two 'lessons' can be drawn from World War I regarding the employment of air power. The first of these is the forcemultiplier effect of air power operating in support of surface forces. The synergy generated by this cooperation was generally acknowledged with enthusiasm. However, the state of aviation technology and that of the associated fields of weapons, communications and navigation, was of too low an order for air power to have a decisive effect in battle. Consequently, notwithstanding Douhet's claims, the status of air power was very much that of an auxiliary component of ground and naval forces. This was true also of the RAF even though it was formed as an independent service in 1918.²

The second 'lesson' that could be drawn from air operations in World War I was the *psychological effect* of air power and the political implications of this effect. The ability (initially grossly exaggerated) of aircraft to bring the war to the enemy's homeland and to directly attack cities and their inhabitants gained air power a reputation as a terror weapon. Fearful descriptions abounded of the outcomes of aerial attacks. J.F.C. Fuller's prediction of the effects of an aerial attack against London is one of the more graphic:

London for several days will be one vast raving bedlam, the hospitals will be stormed, traffic will cease, the homeless will shrick for help, the city will be in pandemonium. What of the government at Westminster? It will be swept away by an avalanche of terror. Then will the enemy dictate his terms, which will be grasped at like a straw by a drowning man.³

² A possible exception was to the subordinate status of air power was the creation of the RAF Independent Force stationed in France in the final years of World War I.

³ Fuller, J.F.C. quoted in Quester, G.H. Deterrence Before Hiroshima, New York, 1966, p 56.

H.G. Wells in his *War in the Air*, published in 1908, also predicted that aerial attack would fell the orderly process of government. Images of bombs raining down on innocent civilians became a primary factor driving efforts within the League of Nations in the early 1920s to define legitimate military targets. Although a list of such targets was developed in the 1923 Hague Rules for Aerial Warfare, the treaty was never ratified by major powers.

It could be argued that the RAF owed its existence to the psychological impact of air power. In mid-1917, two brief air raids over London by German Gothas dropping only 1100 pounds of bombs caused general public alarm and brought much pressure on the Government to improve home defences against further attacks of this nature. Following an investigation and recommendations by General Jan Smuts, Cabinet approved the amalgamation of the Royal Flying Corps and the Royal Naval Air Service to form the RAF. Concurrently, a separate Air Ministry was formed in 1918 and Winston Churchill was installed as Air Minister in January 1919.⁴

The Inter-War Years

In the inter-war period, air power was in a state of flux. The synergistic effect generated by complementing army and navy operations with air power was a lesson that had been well heeded. All industrialised nation states formed air forces either as independent services or as elements of naval and land forces. These formative years were complicated because the rate of technological change was accelerating at a time when there was insufficient experience in air warfare to provide a sound basis for doctrine formulation. At best, only educated guesses could be made on the most appropriate utilisation of air power in war. While this situation did not retard the formation of air forces, it generated an active debate on their proper role and status.

The development of naval aviation had a mixed reception. Japan, the United States and Britain, having a lengthy naval tradition, were the first nations to construct aircraft carriers. The Japanese Navy readily adopted aircraft into its force structure and developed naval air doctrine to accommodate the change. This circumstance owed much to a rivalry with the Japanese army over air force development but was also a result of the Washington Naval Agreement which restricted the

Churchill was also responsible for the Army at the time because he concurrently held both the Air and War Ministries.
construction of certain classes of heavy warship.⁵ The Japanese Navy overcame the constraints imposed by the Washington Naval Agreement by building small aircraft carriers whose enhanced striking power compensated for their small size in operations against larger warships.⁶

However, in Europe there was less enthusiasm for naval Germany and Italy had no role for the aircraft carrier and by aviation. 1939. France had only one converted carrier.⁷ Moreover, even though Britain had the largest carrier force, she 'had failed to develop a doctrine for its offensive use, had too few trained naval pilots and [had] carrier and naval aircraft considerably inferior to those of America and Japan'.8 Undoubtedly the extensive land-borders and short distances between potential belligerents in Europe caused them to place a higher priority in defending against invasion by land. Additionally, the narrowness of the sea lanes in the region weighed against the further development of carrier based air power. By contrast, the United States had fully accepted that aircraft carriers had an important role to play in war. The role of American naval air power was attacking the enemy fleet, protecting the American fleet and providing flexibility to the defence of Pacific possessions.9

The German, Russian and Japanese army air forces were developed and structured with the aim of supporting army operations. The Luftwaffe, although an independent service, was built to complement German army operations and the favoured army strategy of the swift blow with armoured forces. Its force structure of medium bombers, divebombers and heavy attack fighters reflected this role. Major General Walther Wever, known among his contemporaries as a Douhetist, advocated a broader role for the air force.¹⁰ Wever's statement of Luftwaffe doctrine included among the air force tasks:

⁵ Overy, R.J., *Op Cit*, p 12.

- ⁸ Loc cit.
- ⁹ Loc cit.

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Wever was a leading figure in the early development of the Luftwaffe and was appointed its first Chief of Staff. He was one of Ludendorff's staff officers in World War I, learning to fly in mid-career. Wever was influential on German air power thinking until his untimely death in an aircraft accident in 1936.

⁶ Loc cit.

⁷ Ibid, p 7.

'[Destruction of] the enemy air force by attacking it with bomber formations in its own country and destroying its bases and factories, while enemy formation[s] sent out to attack Germany are destroyed by air and ground forces'.¹¹

It is interesting to speculate whether Wever's influence would have led to the inclusion of heavy bombers in the Luftwaffe force structure, had he not died in 1936. Wever had had plans for a heavy Dornier bomber but they were cancelled by Hitler after Wever's death.

As late as January 1943, United States War Department regulations formally subordinated the air forces to ground force requirements and 'to the purely local situation'.¹² By the prescription of these regulations, the air support commander functioned under the army commander.¹³ Moreover, aircraft were liable to be allocated specifically to subordinate ground units.¹⁴ A similar integration of air forces with small land units was also practiced in France. Although the French Air Force had attained independence from the army in 1933, the former's role could be as a form of flying artillery.

The situation in Britain was somewhat different. The RAF insisted on maintaining its independence and argued that the best method of supporting army operations was to attack the enemy economy and rear areas, sources of supply, bases and equipment. RAF doctrine was based on the need to assure the most flexible use of air power and opposed the allocation of air assets to army units. Against strong army opposition, the RAF maintained the conviction that independent tactical bombing of rear enemy areas was the best method of assisting the ground forces and of winning the war. In the end, tactical bombing became accepted as a role for the RAF, although these operations were planned as an integral part of

¹¹ Wever, W., 'Doctrine of the German Air Force' in Emme, E.M., *The Impact of Air Power: National Security and World Politics*, D. Van Nostrand Company, Inc., Princeton, New Jersey, 1959, pp 181-185.

¹² Craven, W.F. and Cate, J.L., (Eds). The Army Air Forces in World War II, Volume II, Europe: Torch to Pointblank - August 1942 to December 1943, The University of Chicago Press, 1949, New Imprint by the Office of Air Force History, Washington DC, 1983, p 137.

¹³ War Department Field Manual 31-35 of 9 April 1942.

¹⁴ Craven, W.F. and Cate, J.L., *Op cit*, p 137.

the land battle and were 'subordinate to the needs of the army commander's immediate battle objective'.¹⁵

Although air operations were initially closely tied to those of the surface forces, the doctrine of independent aerial bombardment or 'strategic bombing' increasingly took hold among air power enthusiasts' in Britain and the United States. They prophesied that decisive victory would be achieved not through the attrition warfare of massed armies but through using air power to destroy the enemy's will to resist by attacking population centres and industries. Within the air arms, there was, naturally, a political agenda behind the fervent adoption of this doctrine. The basic argument was that an independent air strategy ipso facto required an independent air force. Hence, in Britain the strategic bombing doctrine was used to guard air force autonomy, and in the United States this doctrine was used to argue for air force autonomy. The British Government found the strategic bombing concept palatable because it enhanced that country's capacity to resist large-scale invasion and also offered the potential of avoiding army commitments in Europe.

Before the development of air defences, there was thought to be no effective defence against the bomber. For this reason the RAF placed a greater emphasis on bomber development. It cannot be denied, though, that acknowledging the possibility of effective defence against the bomber would undermine the argument for an autonomous air force. Naturally, the RAF was reluctant to make such an acknowledgment. The RAF found the Baldwin Government receptive to the idea that there was no effective defence against the bomber. This was understandable; in November 1932 Baldwin's Government was in the midst of disarmament discussions at the League of Nations. Although it is rarely acknowledged, Baldwin made the following oft quoted statement in the context of these discussions.

'I think it well ... for the man in the street to realize there is no power on earth that can protect him from bombing ... The bomber will always get through $...^{16}$

Baldwin's statement, however, also predated the revolution in air defences brought about by the introduction of fast monoplane fighters and radar. These two developments induced the government to require

¹⁵ Overy, R.J., *Op Cit*, p 12.

¹⁶ Remarks by Baldwin to the House of Commons November 1932. Quoted in Emme, E.M., *Op Cit*, p 51. Emphasis added.

the RAF to place a greater emphasis on air defence and on the production of fighters and other air defence weapons.¹⁷

The doctrine of air defence was slow to spread outside Britain. European countries were concentrating on the more immediate problem of the threat of large scale invasion by land, while America remained committed to the belief that the best use of air power was in offensive operations. In 1936 General Hap Arnold asserted that the:

'whole concept in the Air Force is offense: to seek out the enemy; to locate him as early [and] as distant from our vital areas as we can.'¹⁸

Within air force circles such offensive air operations progressively came to mean strategic bombing. The United States Army's Air Corps Tactical School (ACTS), which had the task of developing air power doctrine, had been formed in 1920 with a curriculum covering all aspects of aerial tactics and strategy. Progressively, though, from 1926 to 1932 strategic bombardment 'against the enemy industrial web' by aircraft operating independently of surface forces became a dominant theme.¹⁹ ACTS deviated from the area bombing concept inherent in Douhet's writings by proposing that it may be possible to identify particular industrial targets whose destruction would effectively disable whole industries and so bring the enemy's war production to a halt. Using the United States as a test case, studies were developed which determined the degree of industrial reliance on the production of vital component parts (such as ball bearings) and the vulnerability of manufacturing facilities to aerial attack.²⁰ Development of the concept of precision bombing was based on these studies. The attractiveness of precision bombing, as opposed to area bombing, was that the former required a relatively small attacking force compared to the bomber fleets envisaged by Douhet.

In summary, by the beginning of World War II, the major combatants had well-established air arms some of which had attained independent status. Air power doctrine included the concepts of command of the air, independent aerial bombardment and air support of

¹⁷ Overy, R.J., *Op Cit*, p 15.

¹⁸ *Ibid*, p16.

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MacIsaac, D., 'Voices from the Central Blue: The Air Power Theorists', in *Makers of Modern Strategy from Machiavelli to the Nuclear Age*, Princeton University Press, 1986, pp 624-647. This citation appears on page 633.

²⁰ *Ibid*, p 643.

the surface forces. However, there was not general agreement on the practical applications of these concepts and on the relative priorities to be afforded to each of these air operations. Within air power circles the concept of independent aerial bombardment was taken up with keen interest because it tended to support air force autonomy. The deficiencies in navigation and targeting technologies, as well as the impact of air defences, which would significantly degrade the effectiveness of such bombing operations were not stressed by air power enthusiasts.

Opposition to the strategic bombardment doctrine, generally from army and navy chiefs, identified these shortcomings. Yet this opposition had a political agenda of its own. Strategic bombing clearly challenged the erstwhile unassailable position of the surface forces as the war winners. Quite apart from any consideration of status, there were definite implications for the distribution of funds between the services. In the event, planning for war assumed the primacy of the surface battle. Hence, although air power had radically progressed beyond the state of technology prevailing during World War I, its planned application in the next world war was to be based largely on the experience of the previous In essence there was a dual problem. On the one hand the one. proponents of air power looked forward without regard to the limitations of the available technology. By contrast, the senior army commanders, who were charged with the conduct of the war, looked back to the last war without taking cognisance of the new air power capabilities. Both The matter was further clouded by parochial outlooks were flawed. service attitudes.

World War II

In the early stages of World War II the use of air power was limited generally to the support of ground forces. There were several reasons for this. First, military conservatism and the lack of experience in independent air operations made senior commanders reluctant to break with past practice. Even if they had been willing to do so, the uncertain state of air power doctrine and the absence of any detailed planning for an air bombardment campaign would have made such an application of air power ineffective. Moreover, no country had either adequate numbers of trained aircrew or an established support infrastructure. Neither had any country adequate numbers of heavy bombers fast enough to avoid fighter aircraft. Lastly, there was considerable political reluctance to make the first unrestrained use of air power; a feared and as yet unknown mode of warfare. Air power working in close cooperation with the surface forces played a vital role in Germany's early victories. The first task of the Luftwaffe was to achieve control of the air by destroying the enemy air force. During the invasion of Poland and Denmark this was a relatively easy task although the Luftwaffe sustained significant losses against relatively light opposition. Once air superiority was achieved the Luftwaffe moved to interdict communications and troop movements thereby isolating the battlefield before providing close air support to the army.

In gaining control of the air, the Luftwaffe appeared to be aiming for nothing less than air supremacy. In the face of ineffective air defences, air supremacy was a feasible goal. It could be argued, however, that air superiority, a more limited level of air control achievable at a lesser cost, may have sufficed. However, the distinction between absolute control of the air and a more limited degree of control does not appear to have been made. In the air attacks which sparked off the Battle of Britain, the Luftwaffe attempted once more to achieve control of the air as a prelude to an invasion by surface forces. However, British air defences were better organised and, with the availability of radar, much more substantial and than those in Poland and Denmark. From 1937, Britain had planned for this contingency by establishing Fighter Command and a centrally controlled network of radar stations. In the ensuing air battle, grievous losses suffered by the Luftwaffe made control of the air an unattainable goal. Consequently, the invasion of Britain was postponed indefinitely.

A major contributing factor to the Luftwaffe's failure in the Battle of Britain was that such a campaign had not been anticipated in mid-1939 and the production of fighters planned for the ensuing two years was inadequate. In fact, Germany's planned aircraft production for the period July to September 1940 was revised downward relative to earlier By contrast, despite German air attacks, British fighter estimates. production over the crucial period exceeded that planned by 43 percent.²¹ A related factor contributing to the Luftwaffe's failure was that German air commanders did not appreciate the difficulty of achieving air supremacy against a well-prepared enemy with substantial economic and industrial resources. Faced with the failure of the air campaign, Hitler ordered an air blitz of the British capital, hoping to conquer Britain before turning toward Russia. The blitz was ordered also partly in retaliation because by September 1940 RAF Bomber Command itself was bombing Germany with increasing intensity.

Overy, R.J., Op Cit, p 32.

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The German blitz did not produce outcomes of strategic value. Its effects were overcome by the dispersal of industries and the rapid repair of railway and port facilities. The Germans were hampered in their efforts by the lack of a heavy bomber force. The payload of the medium bomber fleet was insufficient, as was the accuracy of weapons delivery. Moreover, conflicts among German air leaders over the selection of targets resulted in a dispersion rather than a concentration of air effort.²² If anything, the outcomes of the blitz were negative for Germany. The aircraft attrition rate experienced was high even during night operations. Moreover, there was a steeling of the British resistance. The blitz ended in the spring of 1941; a casualty of technical shortcomings and planning deficiencies.

Even as the German blitz came to a close the allied bomber offensive was increasing in intensity. In the early stages the allies were operating under the same technical problems which had plagued the Targeting accuracy was poor and there were insufficient Germans. numbers of trained aircrew. The efficiency of aircrew was further degraded by inadequate experience in night flying, poor weather, and a paucity of navigational aids. Enemy air defences also contributed in degrading the effectiveness of bombing operations. All these impediments made finding the target difficult, actually hitting targets was nigh on impossible. Accordingly, the RAF eschewed any pretence of attempting precision bombing, opting instead for night area attacks. The United States Army Air Forces (USAAF) carried out what they euphemistically called daylight precision bombing. However, until navigation aids and targeting systems were improved in the latter stages of the war there was very little precision to speak of in these operations.

There are varying opinions on the effectiveness of the allied bombing offensive. Despite a psychological campaign conducted through the dropping of leaflets and the undoubted effect of the bombardments on public morale, the bombing offensive did not spark an uprising against the Nazi regime. Moreover, German counter air defences, like those of the British before them, inflicted heavy losses on the bomber force through anti-aircraft artillery and fighter operations. In addition, countermeasures such as dispersion of industrial facilities were used to good effect. These measures enabled German war industries to continue to operate, in some cases with increased output. By the latter phase of the war, though, production of several key materials such as aviation fuel and nitrogen for munitions manufacture was falling drastically short of requirements. Irrespective of this impact on German infrastructure, arguably the

²² Ibid, p 36.

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greatest contribution of the bombing offensive was that it enabled the allies to continue the war on a 'second front' through air operations while they prepared for a ground offensive. The opening of this 'second front' was also a significant enticement which helped convince the Soviets to join the allies.

In the meantime, in North Africa a new method of using tactical air forces was being worked out by the British Desert Air Force. The new arrangements were a complete departure from World War I practice. In 1914-18 air forces cooperating with the Army were split up; each Army had its air brigade, each corps a wing, and each division a squadron.²³ Under this arrangement concentration of air power was impossible and the air forces' effectiveness was seriously degraded. Hence, RAF commanders in World War II were unwilling to put Air Force contingents once again under Army control. In North Africa Tedder and Montgomery reached an agreement whereby all available air forces would be concentrated into one command, the Tactical Air Force.²⁴ The Tactical Air Force was required to act in close cooperation with Army command. Moreover, Tedder was able to prevail upon Churchill, then Prime Minister, to rule that ground forces must not expect 'as a matter of course' to be protected against aerial attack. Churchill further added that:

'Above all, the idea of keeping standing patrols of aircraft over our moving columns should be abandoned. It is unsound to "distribute" aircraft in this way and no air superiority will stand any large application of such mischievous practice'.²⁵

To the consternation of the army in North Africa, Churchill required the Army Commander to 'specify' to the Air Commander his requirements for air support but left it to the Air Commander to decide how best to comply. Portal, then RAF Chief of the Air Staff, sensitive to 'feelings ... in the highest quarters that the Air Ministry are not sympathetic with the Army's requirements in air support', cautioned Tedder to avoid giving rise to further criticism by putting up 'a thoroughly

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²³ Emme, E.M., *Op cit*, p 220.

²⁴ Tedder, originally deputy and later head of Middle East Air Command was appointed head of Mediterranean Air Command in early 1943. Montgomery arrived in the Middle East to take command of the British 8th Army in mid-1942.

Orange, V., Coningham: A Biography of Air Marshal Sir Arthur Coningham, KCB, KBE, DSO, MC, DFC, AFC, Methuen, London, 1990, p 79. Also Emme, E.M. Op cit, p 220.

good effort when the time comes'.²⁶ Montgomery was sufficiently impressed by the benefits of such cooperation that he proposed that senior officers from England be sent to Africa for instruction on the proper cooperation between ground and air forces:

'They would see the teamwork at a HQ and how we tie up the staff work as between the Army and the RAF staffs; how we work the Army Air Support Control; how we fight for airfields; the whole technique of how we step up the RAF squadrons on to forward airfields, so as to give cover to the forward troops; the AA protection of forward airfields as you advance ... In fact, the whole business. They will never learn these things in England; they would like to, but cannot as it is all theory; here it is all practical.'²⁷

The noteworthy aspect about Montgomery's comments is the implied mutuality in the support relationship existing between the ground and air elements in North Africa. The air forces provided air support to the army and the army assisted the air forces to capture and secure forward airfields. Clearly, the success of this arrangement was contingent upon the goodwill and cooperativeness of air and army commanders and depended on the personalities involved.

The British system of higher command arrangements for the tactical air forces was superior to those applying to the USAAF that participated in Operation TORCH and the Tunisian campaign. Although the original TORCH plan called for an overall air commander, a unified command was impracticable because the USAAF was still bound by War Department regulations which subordinated the air forces to ground force American air power was neither independent nor requirements. centralised because army officers insisted upon controlling their 'own' air power.²⁸ Hence, to begin with, British and American airmen fought separate wars. As a consequence, despite enjoying command of the sea and air, and a large numerical advantage in ground troops, the Allies made slow progress. The situation was at least in part attributable to a confused command structure. By the end of December 1942, Eisenhower, the Allied Commander-in-Chief, had become convinced that a single air commander was necessary to take charge of both the American 12th Air Force and the British Eastern Air Command. Changes in the North African command structure took effect on 10 February 1943. Under the

²⁷ *Ibid*, p 140.

²⁸ Craven, W.F. and Cate, J.L., *Op cit*, p 137.

²⁶ Orange, V., Op *cit*, p 79.

new arrangements a Mediterranean Air Command was formed under Tedder and air forces west of Tripoli were formed into the North-west African Air Forces under Spaatz.

As if to punctuate the need for better employment of air forces, the Americans suffered an embarrassing defeat at the Kasserine Pass in February 1943. Rommel had made a bold push to slice through the rear of the Allied armies to the Mediterranean coast. Had air power been more concentrated Rommel would have been stopped much sooner. Portal attributed this defeat to:

'the defensive "penny packets" policy imposed upon us by the inexperience of the 1st Army under air attack and by the ignorance of High Command about the basic principles of Army and Air Force cooperation'.²⁹

Aside from the relationship between air forces and surface forces, a second major issue that faced American commanders in World War II concerned the command and control of joint air operations. During the war, the United States fielded what amounted to three separate air forces; the air arms of the army, navy, and the marine corps. Joint operations involving elements of the three air arms in the Pacific theatre presented unique problems. The difficulties which arose resulted from fundamental doctrinal differences between the three air arms and were further compounded by poor command structures.

The Battle of Midway, 3 to 5 June 1942, was the first major joint air campaign conducted by American air forces. The air elements which took part in the Battle of Midway were divided into two major components under the command of Admiral Nimitz; carrier-based and land-based air arms. Headquartered at Pearl Harbor, Nimitz did not have a joint staff although he relied on advice from the Commander of the 7th Air Force at Hickham. There was no contact between the carrier- and land-based components other than the transmission of enemy sighting reports by search aircraft operating from Midway. The need for the carrier groups to maintain radio silence in order to successfully ambush the Japanese naval forces was partly the reason for the lack of coordination between the sea and land air components. Perhaps the same reason may account for the lack of coordination in the air efforts of the two carrier As a result there were two independent air campaigns in groups. progress, one sea-based and the other land-based.

²⁹ *Ibid*, p 130-140.

The land-based air component was a mix of marine, navy and army elements. The fact that the disparate air elements based at Midway were physically collocated did not mean that they coordinated their efforts. There was no joint air doctrine nor had there been any training in joint air operations. Moreover, the Commanding Officer on Midway Island relied heavily on the individual initiative of his subordinate air commanders. Hence, it followed that there was no integrated air planning, the three air arms tending to act independently. The net result was that the joint American air forces operated in a piecemeal fashion.



While the Battle of Midway was short, sharp and conducted with hastily assembled forces, the Solomons Campaign, 1942-44, was different. A much longer campaign, it afforded ample opportunity for the planning and setting up of appropriate command arrangements. There was some flexibility as these arrangements were adapted to suit the changing circumstances. Unity in the command of the air arms was achieved and truly joint air headquarters were established. Joint planning enabled the capabilities of each service to be exploited to good effect. However, in one sense the Solomons campaign was not typical of joint/combined air campaigns conducted to date. In this instance, a single service the Navy had overarching responsibility for the conduct of the air war from the outset. Under the exigencies of the situation, the Navy learned to accommodate the special needs of each of the other services.

The Korean War

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In many ways command and control at the operational level during the Korean War was a regression to earlier times of fractured command and divided air effort. By the time the war started on 25 June 1950, the USAF had been an independent service for three years. The period before the Korean War had been marked by an intense dispute between the USAF and the United States Navy over their respective air roles and missions and the aircraft necessary to support these. This dispute was carried out against a backdrop of a significant decline in defence budgets post-World War II.

The Commander in Chief, Far East Command (CINCFE) had under him three service components; Far East Air Forces (FEAF), Naval Forces Far East (NAVFE), Army Forces Far East (AFFE). CINCFE's headquarters was joint only in name; in essence it was an Army organisation. There was a consequent lack of understanding of the nature of joint air operations at the operational level headquarters which hindered the establishment of adequate command and control arrangements. Until 3 July 1950, when NAVFE commenced air operations, FEAF had sole responsibility for this role. Hence, until that date the control of joint air assets had not been an issue. Understandably, this was to change with the commencement of naval air operations.

The crux of the dispute between FEAF and NAVFE was that the former wanted to exercise 'operational control over all naval land-based and carrier-based aviation when operating from Japan or over Korea'.³⁰ NAVFE, concerned that such an arrangement would mean that naval air assets would be continuously assigned to FEAF to the detriment of its other responsibilities, naturally baulked at the idea. Instead, NAVFE sought to have a separate geographic region assigned to it for its own air operations. CINCFE attempted a compromise by making FEAF responsible for *coordination control* of air operations. The unfortunate aspect of this arrangement was that the extent of authority associated with this responsibility was never clarified, with the result that FEAF

Winnefeld, J.A. and Johnson, D.J., *Command and Control of Joint Air Operations: Some Lessons Learned from Four Case Studies of an Enduring Issue*, RAND, Santa Monica, 1991, p 26.



interpreted it as conferring authority to task naval aviation. On the other hand, NAVFE contended that it only entitled the latter to *request* naval aviation assistance from CINCFE and NAVFE, and then to arrange for mutual support and deconfliction. The net outcome was that NAVFE behaved autonomously in committing its air assets in support of the other two components.

The provision of close air support to the ground forces was another problem area. In early July 1950, a joint operations centre (JOC) was formed in Korea for the purpose of facilitating the coordination of air and ground operations. The Army was not ready to participate in the JOC when it was first established and NAVFE was resisting efforts by FEAF to gain operational control over naval air assets. Consequently, in the initial stages the JOC was run predominantly by FEAF which also provided the majority of air assets for the early operations. Finally, after the demand for air support exceeded FEAF's capacity to provide it, CINCFE ordered NAVFE to make a contribution. The coordination of the air effort became further complicated when Marine air elements originally based in Japan joined the conflict in August 1950. Eventually, FEAF and the Marine air elements were able to find a mutually accommodating command arrangement.

As the war progressed, the functioning of the joint air control system improved because of the increased pressure applied by the Chinese intervention in late 1950. However, the establishment of the JOC was still beset by substantial difficulties. The main difficulty was the lack of a joint air doctrine and procedures. In their absence, and in the absence of a truly joint operational headquarters, pre-war inter-service disputes and inherent doctrinal differences were the cause of much friction. Compounding the problem was the paucity of communications and the initial physical separation of the two major components: Army and Air Force.

A further problem was that FEAF was not well equipped to support ground forces, its aircraft were more suited to the conduct of an independent air campaign. Hence, its force structure did not fit the circumstances in which FEAF was required to fight. To retrieve the situation strategic bomber forces were used to perform tactical support missions for which they lacked the equipment, training and organisation. These bomber forces were organised into a Bomber Command shortly after the war started. FEAF Bomber Command was independent of the Fifth Air Force which was tasked with tactical support operations. However, when tasked with close support missions, Bomber Command came under the Control of the JOC.

Unity in the application of air power was not achieved in the Korean War. Although FEAF had coordination control responsibility giving it the lead in coordinating joint air efforts, the former did not have the authority to task or direct the operations of the other services. Hence, the FEAF, NAVFE and Marine air arms acted independently. To alleviate these command and control problems, North Korea was divided into specific service zones; a precursor to the route package system adopted during the Vietnam War.

Several lessons in relation to the employment of air power may be derived from the Korean War. First, is the need for joint air doctrine. Much of the friction between the components would have been avoided had there been universal agreement on the correct employment of air power. The second major lesson is the need for a centralised air control system which is responsible for matching requirements for air power to available resources. Underpinning the effective functioning of such an air control centre would be; the availability of effective communications, and

an uncomplicated command structure with clearly stated responsibilities and delegations of authority.

Vietnam War

These lessons do not appear to have been heeded a decade later because the command structure that was established for the Vietnam War was equally convoluted and the control of air power was just as fragmented as had been the case in Korea. The command structure for the Vietnam War grew out of the Military Advisory Group which was established in 1950 and was subsequently redesignated Military Assistance Advisory Group, Vietnam (MAAG) in 1955. By the beginning of 1962 the United States commitment to Vietnam was rapidly expanding and it was decided to reorganise MAAG to provide better control of American activities. In particular, there was a perceived need to formally separate the advisory function from training and operational activities. Military Assistance Command Vietnam (MACV) was formed in February 1962 as an operational headquarters with 'a nucleus of staff that could direct expanded combat operations'.³¹ MACV was established as a subunified command under the Commander-in-Chief Pacific Command (CINCPAC). As a sub-unified command, MACV was presumably an integrated organisation in which no one service held a dominant position. However, senior appointments in MACV were dominated by Army officers. The positions of Commander, Deputy Commander and three of the six key staff appointments were manned by Army officers.³² USAF officers held two of these six positions while the sixth was held by a Marine officer.³³

MACV became a combatant command in 1965 following the arrival of significant American forces. Although MACV adopted a component command organisation, there was no separate Army Component Command. As in the Korean war, Commander MACV took on that role utilising MACV headquarters staff in lieu of establishing a separate Army component headquarters. The MACV air component was initially the 2nd Air Division which subsequently reformed as the 7th Air Force, one of the numbered Air Forces under the Commander of Pacific

³¹ Momyer, W.M., Air Power in Three Wars (WWII, Korea, Vietnam), Washington DC, 1978, p 68.

³² Loc cit.

³³ Loc cit.

Command Air Forces (PACAF).³⁴ The naval component was the Naval Forces, Vietnam (NAVFORV). (See Figure 3.) Hence, naval and air forces were provided to MACV by CINCPAC who retained tight control of the majority of these forces through his component commanders. This situation led a frustrated, General Westmoreland, Commander MACV, to complain that:

'In view of this command arrangement, seeds of friction not unlike those that had plagued MacArthur and the Navy during World War II were present ... What many failed to realize was that not I but [Admiral] Sharp [CINCPAC] was the theatre commander ... My responsibilities and prerogatives were basically confined within the borders of South Vietnam. Admiral Sharp commanded the Navy's Seventh Fleet, over which I had no control ... When the bombing of North Vietnam began in February 1965, Admiral Sharp controlled that too.'³⁵

CINCPAC was opposed to any basic change to this command structure because in his view it gave him maximum flexibility for concentrating his forces against the Chinese, a major threat at the time. The existing arrangement also gave CINCPAC overall direction of the air war. He determined the assignment of air strikes against North Vietnam between PACAF and Pacific Command Fleet (PACFLT). These strikes would eventually be carried out by 2nd Air Division and carrier Task Force 77 (TF-77), respectively. There was no overall air coordinating authority. CINCPAC would designate either PACAF or PACFLT as the coordinating authority for a specific strike. The call from airmen to establish a single air commander for the command and control of all air operations - Air Force, Navy and Marine - went unheeded.

In many respects the commander 2nd Air Division was the meat in the sandwich. He had direct control over fighter wings participating in the air campaign but was responsive to CINCPAC, PACAF, and the 13th Air Force. After the 7th Air Force was activated the confusion increased:

'Instead of providing the 7th Air Force with complete control over the 2d Air Division assets, PACAF gave the 7th Air Force "operational" direction over the fighter wings, while the 13th Air Force retained "administrative" control. The ultimate result of this bizarre

³⁴ In July 1965 2nd Air Division was separated from the 13th Air force and placed directly under PACAF. Eight months later, on 14 March 1966, the 2nd Air Division was disbanded and reformed as the 7th Air Force.

³⁵ Westmoreland, W.D., A Soldier Reports, Doubleday & Co, New York, 1976, p 76.



arrangement was the creation of the 7/13th Air Force in Thailand, which then assumed *administrative* control of the fighters!³⁶

Overlaying the command and control difficulties were doctrinal differences between the various air arms which made coordination even more difficult. The introduction of large numbers of helicopters by all services brought into greater relief these differences in air doctrine. It also intensified the debate over the division of roles between the services. Concern arose that the Army's use of helicopter gunships was an attempt by that service to usurp an Air Force role.

In Vietnam, as in the Korean War a decade earlier, control of air power was fragmented. Unity of command was centralised at CINCPAC level but there was disunity below this echelon. This prevented an effective unity of air effort. Hence, ROLLING THUNDER, the early strategic bombing campaign, was not coordinated with other air operations in South East Asia. Moreover, a system of route packages was introduced whereby Navy and Air Force air operations were geographically

Clodifelter, M., Op cit, p 128. (Emphasis in the original)

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segregated. The route package system fuelled an intense inter-service rivalry. Because of this rivalry, there were constant attempts by each of the services to out-perform the others. In this competitive environment the generation of high sortie rates was equated with high combat effectiveness. As a result air power was misused. Aircraft would be launched in poor weather and, during a munitions shortage in 1966, with partial bomb loads in an effort to keep up the sortie rate.³⁷

With the despatch to Vietnam of additional bombers in early 1965, the United States commenced the ROLLING THUNDER bombing campaign. The success of this air campaign was severely hampered by political controls, but it was also adversely affected by a dysfunctional intelligence system and a misplaced emphasis on bomb damage statistics. Although these latter factors were significant contributors to the failure of ROLLING THUNDER, the debilitating effects of the political controls should not be underestimated.

Figure 4 illustrates the strategic target nomination and approval process. Target approval was managed in detail at the highest level by the President, although targets were nominated by a wide range of civilian and military agencies. There were two inherent problems. First, the approval process was tied to the President's weekly meetings with his advisers which resulted in a 'creeping release of targets' effectively preventing a build-up in the tempo of operations.³⁸ Second, each of the agencies involved in the target nomination and evaluation process relied on its own intelligence sources. There was no single intelligence picture, rather there was a multiplicity of often divergent assessments. The outcome was ineffective target selection, and an ineffective air campaign.

Yet the failure of the campaign was buried under a mountain of battle damage statistics that painted a rosy, if false, picture. Numbers became important; enemy bodies counted, structures destroyed, ordnance expended. These statistics, however, could not obscure the undeniable fact that the United States was losing the war. Hence, the credibility of the American Government and that of the American military suffered under a barrage of media reports which consistently drew attention to the

³⁷ *Ibid*, p 131. Clodfelter also recounts this telling incident at Note 57, p 243. 'In July 1966, shortly after General William C. Momyer replaced [General] Moore as Seventh Air Force Commander, a period of poor weather obscured targets in the Red River Valley. Momyer ordered his units not to fly and called for ground crews to perform preventive maintenance. A message soon arrived from the Pentagon telling Momyer to fly to prevent the Navy from tallying a higher sortie count.'

³⁸ Momyer, W.M., *Op cit*, p 231.

paradox that the war, which according to these measures, appeared to be increasingly successful, in fact was being lost.



The Arab Israeli Wars

Whereas much of the malaise that affected American military operations in Vietnam owed its origin to unclear strategic objectives, the Israeli Defence Force (IDF) has never had to contend with this problem. Israel's precarious strategic situation has meant that national security has always been the prime imperative in the many conflicts that troubled nation has been involved in. Indeed the unusual nature of the Israeli strategic environment should be cause for caution in any effort to draw lessons in the application of air power from the Arab-Israeli wars.

Notwithstanding recent efforts to create a lasting peace with its neighbours, for most of its short history, Israel has been a tiny nation, surrounded by hostile states: Egypt, Jordan, Lebanon and Syria. Beyond these there are other Arab states which were opposed to the existence of a Zionist homeland in their midst. As a result, Israel has had to defend its

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very existence through armed conflict throughout its history. It is in this context that the nature and role of the Israeli Air Force and its relationship to the remainder of the IDF must be seen.

The Israeli Air Force (IAF) was created in a security environment where the threat to the nation was readily identifiable. Consequently, the IAF's mission is clear: to defend Israel and to protect the Israeli ground forces from enemy air power. This has meant that the factors which determine the size and structure of an air force were unequivocal. Israel has a small population from which to raise a defence budget and to draw defence force personnel. Moreover, its small population and geography makes it particularly vulnerable in a multi-front war. These factors and the hostility of Israel's neighbours have several implications for the IAF. First, the ability to gain and hold air superiority becomes vital to the survival of the IDF and by extension the nation. Second, the IAF can never be built on a large scale given Israel's limited population and resource base, hence, it is necessary to make up in quality what is lacking in quantity. Third, given the time and effort it takes to train highly competent aircrew for combat, the IAF cannot afford to adopt the army policy of having a small standing force which is expanded in a crisis. As was the case in 1967, a war can be won and lost in a matter of days. Thus, in contrast to the Israeli Army, the IAF must operate on high readiness levels in order to be able to carry the battle while the remainder of the defence force is being mobilised.

In order to counter the numerical superiority of its traditional enemies, Israel must be prepared to take the military initiative. It. certainly has shown that it is not reluctant to do so. In initiating the 1967 War, Israel pre-empted an Arab attack by carrying out its own strike against Arab air force installations. In June 1981, the IAF carried out a copy book air raid destroying the Iraqi Osirak nuclear facility. Just twelve months later, the Israeli Defence Force launched Operation PEACE FOR GALILEE with the objective of destroying the Palestine Liberation Organisation forces in southern Lebanon. Vital to the success of this operation was the destruction of nineteen Surface-to-Air Missile (SAM) batteries located in the Beka'a Valley whose presence had been a significant constraint to the IAF. In a perfectly orchestrated operation the IAF, in cooperation with Israeli ground forces, not only succeeded in destroying the SAM batteries but also destroyed a good part of the Syrian Air Force. In the first phase of the operation, Israeli long range artillery attacked the SAM batteries. The IAF then followed striking with free-fall bombs and anti-radiation missiles. When the Syrian Air Force attempted to defend the SAM sites, it suffered grievous losses against the IAF.

These conflicts have several characteristics in common which may be useful *lessons*. The first such characteristic is that the IAF is employed as a theatre resource conducting concurrent operations across the depth and breadth of the theatre. This implies a balanced force structure and a command arrangement which allows unity of air effort. The second key characteristic of IAF operations, is the high professionalism and skill of Israeli aircrew. The competence of IAF aircrew repeatedly has enabled them to win against numerically superior Arab air forces. One testament of the IAF's capability is the reluctance shown by Arab airmen to engage them in aerial combat. Another vital element in IAF operations is the quality of Israeli military intelligence. Having good intelligence on enemy positions, force composition, and intent enables the Israeli Defence Force to carry out detailed planning minimising the impact of chance and the likelihood of *friction* induced reverses.

From the perspective of the operational level, the most important lesson to be derived from observing the Israeli Defence Force at war is the way that its various arms combine in mutually supportive The Beka'a Valley victory was one that belonged to the operations. combined air-ground arms and not to any one force. The destruction of the SAM sites was achieved through the joint action of the Israeli Army's long range artillery and the IAF. Reminiscent of the air-ground mutual support and cooperation present in North Africa during World War II, this action where ground forces supported the IAF mission of achieving air superiority, is not unique in Israeli military history. In the Yom Kippur War of 1973, the Egyptian army had established bridgeheads along the length of the Suez Canal in the Sinai. These bridgeheads were protected by an effective air defence missile system which the IAF had been unable to degrade despite suffering serious losses. The IAF found it could only attack Egyptian forces advancing beyond this protective umbrella. Israel was able to regain air superiority in the Canal area only after Israeli ground forces over-ran several missile sites creating a gap in the air defence system, which the IAF was able to subsequently exploit.³⁹

The Yom Kippur War is instructive not only because the Israelis managed to win against overwhelming odds. This war is also noteworthy because the Egyptians were able to counter the Israelis' known strengths in the air and in IAF supported mobile ground warfare.⁴⁰ The Egyptian plan involved the development of a sophisticated integrated air

³⁹ Narayan, B.K., Lessons and Consequences of the October War, Vikas Publishing House, New Delhi, 1977, p 21.

Dupuy, T.N., Elusive Victory: The Arab-Israeli Wars 1947-1974, MacDonald and James, London, 1978, p 389.

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defence system, which included Soviet SA-6 surface-to-air missile systems and the ZSU 23-4 self-propelled anti-aircraft gun, against which the IAF had neither effective countermeasures nor adequate attack tactics. The air defence system created by the Egyptians and the use of ground forces to degrade it by the Israelis exhibited a flexibility of approach. Both sides demonstrated a reluctance to follow the previously stereotyped solution to the air superiority problem by leaving the attainment of air superiority to their respective air forces. Of course, there was a danger that once the effectiveness of ground-based air defences had been demonstrated, that it would become accepted orthodoxy, at least within the Arab world.

Iraq appeared to have become convinced of the efficacy of ground-based air defences by the time the Iran-Iraq War began in late 1980. This war was remarkable for the apparent inept use of air power by both belligerents. Neither the Iraqi nor the Iranian Air Forces appeared to be willing to mass its forces for the purpose of offensive operations, the emphasis seemed to be on the preservation of air assets.⁴¹ This was a feature of the Iraqis' use of air power which was to cause much puzzlement during the 1991 Gulf War.⁴²

NATO Air Strikes in Bosnia

In some situations, the application of air power in this way can be of limited, if not questionable, value. NATO's use of limited air strikes against Serbian gun positions in Bosnia have achieved less than decisive results. By the time the first strikes were carried out in April 1994, the conflict between Bosnian Muslims and Bosnian Serbs had been in progress for just on two years. Efforts at mediation had only succeeded in yielding multiple cease-fire agreements which had been violated within days, and often hours, of coming into effect. A United Nations (UN) Protection Force (UNPROFOR) has operated in the former Yugoslavia with little success.

In July 1993 NATO had declared its intention to provide air support for the UNPROFOR. Serbian forces, having access to weapons belonging to the former Yugoslavian army and significant caches of munitions, were less affected by the UN arms embargo than Bosnian Muslim forces. Having this advantage enabled the Bosnian Serbs to

⁴¹ Bergquist, R.E., *The Role of Air Power in the Iran-Iraq War*, Air University Press, Maxwell AFB, Alabama, December 1988, p 76.

⁴² The Gulf War will be discussed in detail in subsequent chapters.

occupy an increasing amount of territory. In the face of this aggression, and many reports of systematic criminal actions, Western powers came under heavy criticism for an apparent lack of resolve to take decisive action. Adding to the sting of this criticism were some uncomplimentary comparisons made by the media between the present inaction and the rapid response to the Iraq-Kuwait crisis.

In August 1993, the NATO air effort was raised a level by the decision to carry out strikes against Serbian heavy artillery positions besieging Sarajevo, one of seven 'safe-areas' declared by the UN. However, no air strikes had been carried out by February 1994 when a suspected Serbian mortar attack against shoppers in a Sarajevo marketplace resulted in 68 civilian deaths. NATO demanded that Serbian heavy artillery be withdrawn from a declared exclusion zone around Sarajevo and placed under UNPROFOR control. If they did not comply, Serbian positions around the former Yugoslavian capital would be bombed. Because of Serbian non-compliance, air strikes were carried out in March 1994. Additional air strikes followed, the most recent in November 1994. Notwithstanding the present cease-fire, the apparent result of these air strikes was to spur further Serbian aggression and defiance.

There are several reasons why the use of limited air strikes in this setting was less than optimum. For air strikes to be credible, there would need to be a demonstrable ability to eliminate or significantly degrade the Serbian capacity to menace the Muslim populations of Sarajevo, Bihac and other cities. This entails the ability to effectively locate, identify and target Serbian aggressor groups. The task of doing so is not such an easy one given the ability of the Serbs to blend in with the civilian population and the difficulty of locating well concealed, mobile mortar companies and artillery. An inability to have a decisive impact on Serbian operations is sure to backfire in several ways. First, it would be a significant political failure and evidence of impotence on the part of the United States, NATO, the UN and the European Community. Second, whenever NATO aircraft are shot down disharmony between NATO and the UN is caused by disagreements regarding the use of air strikes. Negative feelings in these forums would be particularly directed against the United States which has taken the lead in urging such action upon its allies. Furthermore, the protracted nature of the conflict, the apparent impotence of the various mediating parties and the open defiance of the Serbians gives rise to negative domestic reaction in each of the countries taking an active part in the mediation process and in the retaliatory air strikes. Additionally, in the event the Bosnian Serbs shoot down further NATO warplanes, their defiance would receive a boost.

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More importantly, for operations, the Serbs retain the initiative having the options of retaliating against UN peace-keepers and/or foreign aid workers, and moving against other safe enclaves. The Serbs have done both in the past. Persistent attacks against the Serbs have angered Russian President Yeltsin who is under pressure from the pro-Serbian nationalist faction in his country. Given that the United States has lifted its embargo against the provision of arms to the Bosnian Muslim forces, a continuation of the air strikes may serve to broaden the conflict if Serbia and the Croatian Serbs seek to take a part.

For all these reasons, in circumstances similar to those prevailing in the former Yugoslavia, limited air strikes may be of questionable value. Indeed, it can be argued that the air strikes were not an important factor in the present cease-fire agreement between Moslem and Serbian forces in Bosnia. Bosnian Serb aggression against Gorazde and more recently Bihac followed NATO air strikes. From the outset there was little operational value in limited NATO air strikes. To further complicate matters there was dual control at the strategic level; both NATO and UN approval was necessary for the air strikes to be carried out. This resulted in a lack of clear political direction. Additionally, operational level command did not appear to be vested in any one officer, either in the UN or NATO organisations. The commander of the UNPROFOR only had the authority to call on NATO air strikes within specific circumstances. The decision to conduct these operations was more a political one reflecting media pressure on the United States and NATO, and also the former's reluctance to commit ground forces. As one unattributed description would have it, this was another case of 'policy by CNN'.

In this type of situation the operational commander is in a difficult position; on the one hand he has to adhere to political directives and yet on the other the pitfalls of the situation are all too evident to him. The only recourse is to show clearly the futility and risks associated with militarily unsound actions such as the NATO air strikes and where possible propose more effective action. This task is made easier if the military-political relationship is characterised by mutual trust and respect. If this is the case the political leadership is likely to place greater weight on military advice than would otherwise be the case. Where possible efforts should also be made to involve civilian security advisers and the political leaders in military exercises requiring strategic level inputs. Operational level headquarters command post exercises would be an ideal opportunity. Such exercises would expose senior security advisers to military decision making with the possibility of improving the quality of their advice to government in genuine contingencies.

Conclusion

The primary function of operational level command is to direct all energy, resources and activities towards the achievement of the strategic objective. Hence, operational level command is concerned with achieving a unity of effort. This is done through the development of common plans and through the creation of a command structure which supports such a unity of effort.

Each of the conflicts discussed above occurred under unique circumstances determined by the physical environment, the state of technology, and the political conditions which prevailed. However, in examining the command and control arrangements and the way air power was employed in each of these conflicts certain recurrent *themes* were evident that did not appear to be determined solely by the conditions under which the conflict was fought. These may provide useful and enduring guidelines for future warfare.

The first such theme is that the effectiveness of joint or combined operations is degraded if a common war fighting doctrine is Without a common doctrine the planning, direction and lacking. execution of combat operations becomes a complicated exercise beset by misunderstanding, argument and confusion. The need for such a doctrine is particularly important for the effective use of air power. The airspace environment, air power's field of battle, is a continuum. Air platforms have been developed to make maximum use of this environment; they are fast, versatile and have the capacity to operate at extended ranges. This gives air power the ability to rapidly concentrate high levels of firepower at great distances, and the ability to quickly reconfigure for various roles and missions. Air power is thus able to operate across the depth and breadth of the area of operations in a multiplicity of roles, concurrently impacting conflicts in the land, sea and air environments. Despite such capabilities the effectiveness of air operations was degraded in the Korean and Vietnam wars because of fundamental differences between each of the American services on the proper application of air power. The outcome of these differences was such that unity of effort in the employment of air power was lacking with the result that the air war was artificially subdivided along service lines.

By contrast, during World War II, in the North African campaign, effective principles had been developed for the employment of allied air power. Under Air Marshal Sir Arthur Coningham, the tactical air forces and ground forces worked in close cooperation providing mutual support. This was especially evident in the way air and ground forces cooperated in capturing and securing forward airfields which helped the Allied Air Forces extend the area over which they exercised control of the air. The benefit to be derived in such mutual support was not lost upon the Israelis several decades later. As was seen during the 1973 Yom Kippur War, Israeli armour was used to degrade Egyptian air defences enabling the Israeli Air Force to regain air superiority. Israeli artillery and air power combined in a similar manner to achieve the same end in the Beka'a valley.

The lesson to be drawn from these examples is that there are synergies to be found in joint action which are not always possible with single service operations. To enable such synergies to be exploited through a unity of effort there is a need for doctrine to be developed for combined arms action.

A fundamental aspect of such doctrine would be the role of air power. The unique and diverse capabilities that air power has make it dependent on advanced technology; this in turn makes air power an expensive resource. The high cost of air assets generally means that fleet sizes are limited. Therefore, to make effective use of these resources, their employment should be guided by the scarcity principle. Fundamental to Coningham's operations in North Africa, this principle requires that scarce resources such as air power be employed only on the highest priority tasks and be controlled at the highest level. The implication is that there should be an awareness by all concerned that, depending on the availability of air resources, tasks of a relatively lower priority may not be performed. The setting of air task priorities should be made in accordance with the operational commander's objectives. Therefore, control of air power should be centralised at the operational level where these objectives are set and where the entire theatre situation is appreciated. Centralised control allows air power to be used in a manner which is responsive to the evolving theatre situation. Any other arrangement will lead to sub-optimal utilisation of air effort. The implication of centralised control is that there is a single air tasking authority.

A second recurrent theme in the above examination of past conflicts is the impact that the command and control organisation has on effective operations. The command and control organisational structures of the American forces in the Korean and Vietnam conflicts were confused and defied attempts to integrate the efforts of the various force elements. The basic principle upon which a command organisation should be built is that of simplicity. The lines of command should be as simple as possible with each appointment having clearly delineated responsibilities without any overlapping or grey areas. Where a component command structure is adopted, the employment of joint staff in the operational level headquarters should be of a mix appropriate to the composition of forces

under command. This should ensure a balanced approach to planning and provide an avenue for advocacy for each component.

A central issue is the degree of unity of command that is necessary to achieve unity of effort. During the Korean and Vietnam Wars unity of command was provided at the operational level, but at lower levels there were inadequate mechanisms for integration of effort. The absence of joint headquarters made such an integration difficult and so the American service air arms were divided in their efforts. Attempts at imposing cooperation over a divided, confused command structure proved to be impossible. By contrast, a noteworthy feature of Israeli operations is the unity of purpose and effort achieved. Naturally, the unique circumstances of Israel's security environment, and small population and resource base mandate such unity for the survival of the nation.

The creation of the command structure and the assignment of resources is generally an area of active debate between the services. The contention is that this debate should be structured around achieving unity of effort in conducting operations for the attainment of the strategic objectives.

CHAPTER SIX

AIR POWER - THE CURRENT STATE OF THE OPERATIONAL ART

A New Perspective on Synergy

Recently there has been a heightened interest in applying military power in such a way as to maximise the synergy of forces. This interest has resulted in a greater emphasis on joint operations. In the military context, synergy may be defined as the employment in combination of the different forms of combat power such that the total effect is greater than the sum of its individual parts. Synergy is the forcemultiplication effect that may be derived from directing military effort in a coordinated manner toward the achievement of the strategic objective. The notion of synergy in military operations is not new. Pursuit of synergy underpins the principles of war, particularly the principle of *cooperation*.

Although, the concept of synergy is not of recent origin, the *level* at which synergy now is pursued *is* new. In the past, synergy was sought at the tactical level. Until the allied bombing offensive of World War II, the formal mission of air services was to act as a subsidiary to surface forces while the latter were tasked in accordance with their traditional roles. In this situation, synergy was impossible to achieve. Synergy demands that forces are not automatically tasked in accordance with their traditional missions and roles, but rather in such a way as to best exploit their capabilities in the accomplishment of the task at hand. That does not imply the adoption of a joint force structure and the conduct of joint operations just for the sake of giving each service 'a piece of the action'. Rather, the objective is to use the available tools and forces in a manner best suited to achieving the strategic objective.

Centralised Control of Air Power

The heightened focus on synergy has a particular impact on the way the role of air power in war is viewed. Its unique attributes enable

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air power to carry the fight simultaneously at all levels of war, and to all parts of the theatre of operations. Accordingly, it is only when air power is viewed as a theatre-level resource that its true value in contributing to the synergy of military operations can be fully assessed. Past experience has shown that the inherent versatility, flexibility and responsiveness of air power become degraded the more control of this resource is divided and compartmented. This was a costly lesson learnt in North Africa and in the Pacific during World War II, and once more in Vietnam two decades later.

Out of these experiences was derived the guiding principle of unity in the application of air power. Unity as it applies to air power does not imply indivisibility, but it does imply centralised control in war. Without centralised control commanders cannot hope to fully exploit the unique qualities of air power. With such control it is possible to quickly concentrate air power at decisive points, enhancing one's ability to take advantage of opportunities and to react to reverses.

For best effect, centralised control should be exercised at the Moreover, authority for control highest appropriate command level. should be vested in one who is expert in the application of the air power capabilities being employed. Assigning control to non-expert commanders is done at the risk of degrading the utility of air power. Because air power has the potential to contribute across a broad spectrum of the battle in the sea, land and air environments, it would be reasonable for control to be exercised at the operational level of war. Naturally, though, this would depend on the nature and size of operations, and the nature and degree of air power involvement. In combat, air power is usually a scarce, yet highly sought after, resource. Having a highly placed authority controlling air power tasking allows for a balanced prioritisation of air effort. The higher the command level the broader the view of the war. A broad perspective, enables both long term aims and immediate goals to be understood. This allows the relative importance of immediate needs to be balanced against that of medium and long term imperatives.

Field commanders do not have a broad perspective, nor do they have the time, usually, to look beyond tomorrow's battle. Moreover, their attention is properly focussed on their line of advance. So that for them the *psychological* value of air power that is visible has a particular importance. As one writer puts it:

'For the ordinary soldier, air support is the support that he can see: the fighter formation driving the enemy away, the bomb-line ahead of him, the supply drop. An air battle out of sight is a battle that never happened; air attacks on enemy communications or distant assembly points are equally non-events.^{'1}

For a long time traditional army doctrine reinforced this perspective, despite several decades during which air power operations had effectively extended the field of battle to unprecedented proportions. It was not until the early 1980s that American Army doctrine formally recognised the existence of 'the extended battlefield'.² This concept was central to the AirLand Battle doctrine as expressed in the 1982 issue of Army Field Manual FM 100-5, *Operations*. With this new doctrine, Army war planning shifted emphasis from the close battle along the forward edge of the battle area, to conducting aggressive offensive action across the depth of the battlefield including attacking enemy rear echelons. Current United States Army doctrine reinforces this principle:

⁶Commanders set favourable terms for battle by synchronising ground, air, sea, space and special operations capabilities to strike the enemy simultaneously throughout his tactical and operational depths. The theatre commander attacks the enemy at strategic depths to set conditions for deeper operational maneuvre."³

Despite this new doctrine, tension between American air and ground commanders regarding the use of air power persisted in the 1991 Gulf War. The principal points of disagreement concerned the relative priority and importance of air and ground campaigns, and when emphasis in the air apportionment formula should shift from one to the other. Disputes on these and other issues arose during the Gulf War and needed to be resolved by the operational commander.⁴

The objective of centralised control is not to direct every facet of air operations. Rather, the objective is to remove from the application of air power the constraints inherent in dispersed command. If control in detail were attempted, the flexibility and responsiveness of air power would be degraded. Consequently, the function of a central command authority should be limited to providing broad planning and direction. By

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Keaney, T.A., and Cohen, E.A., Gulf War Air Power Survey Summary Report, US Government Printing Office, Washington DC, 1993 p 155.

Terraine, J., *Right of the Line*, Hodder and Stoughton, London, 1985, p 156.

² Romjue, J.L., 'The Evolution of the AirLand Battle Concept', *Air University Review*, May-June 1984, p 12.

³ FM 100-5, *Op Cit*, p 6-15. (Emphasis added.)

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implication, subordinate levels of command should be delegated a measure of latitude and freedom to plan and execute their assigned tasks.

In the same way that there is the need to control air power, there is a concurrent need to control the airspace environment. In modern battle the airspace environment is a crowded place. It is traversed by fixed- and rotary-wing aircraft, remotely piloted vehicles, missiles and artillery under the control of several services. Therefore, there needs to be coordination of all the users of the airspace to avoid fratricide. Providing for centralised control of air power enhances the capability to deconflict friendly forces.

The Joint Force Air Component Commander

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In United States joint operations, control of air power is centralised under a designated Joint Force Air Component Commander (JFACC). The JFACC concept originated in the mid-1980s after a serious debate among the American military services. The debate grew out of Congress demands for 'jointness' and the difficulties that American forces experienced during Operation JUST CAUSE in Grenada. According to American doctrine, the JFACC is normally designated by, and derives his authority from, the Joint Force Commander. The specific authority to be exercised by the JFACC, whether it is operational control or tactical control, is also established by the Joint Force Commander.⁵ Typically, the JFACC would exercise operational control over assigned and attached forces and tactical control over other forces made available for tasking.⁶

The specific responsibilities of the JFACC are also assigned by the Joint Force Commander. Normally, these responsibilities would

Tactical Control, also according to American military doctrine is the detailed and usually local direction and control of movements or manoeuvres necessary to accomplish assigned missions or tasks. (Joint Pub 1-02).

JFACC Primer, Deputy Chief of Staff, Plans and Operations, Headquarters USAF, 2nd Ed, February 1994, p 9.

Operational control according to American military doctrine is the authority to perform those functions of command over subordinate forces involving organising and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. It does not include authoritative direction for logistics or matters of administration, discipline, internal organisation, or unit training. (Joint Pub 1-02).

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include air campaign planning, coordination, and the allocation and tasking of joint air operations based on the Joint Force Commander's apportionment decision. Although it is the latter who ultimately decides how air effort is to be apportioned, the JFACC is responsible for recommending an appropriate formula. The recommendation of how air effort should be applied across the various roles, missions or geographical areas, is based on the Joint Force Commander's guidance and is negotiated with the other component commanders.

JFACC's Command Relationships

In joint operations involving American forces, the Joint Force Commander exercises operational control through component commanders. The component commands may be structured along single service lines or functional lines. The single service component organisation, as the name suggests, is comprised of a single service staff with liaison cells from the other services. Functional component organisations would be manned by joint staffs. In a service component structure, the component commander with a preponderance of air power assets in the theatre would normally perform the JFACC function. For example, a campaign that involved mainly carrier aviation would normally have a navy JFACC. In a joint force organised into functional component commands, the JFACC would be one of the functional component commanders. Figures 1 and 2 illustrate the structure of the service and functional component organisations.

The appointment of the JFACC is totally within the Joint Force Commander's discretion. In neither the service nor functional component joint force structures, is there an assurance that the senior Air Force officer would be designated the JFACC. Moreover, the JFACC does not necessarily control all theatre air assets, so that this designation can be misleading. The Army, for instance, retains control of its organic aviation for use as manoeuvre units although some assets such as helicopters and cruise missiles may be made available to a non-Army JFACC for employment on interdiction tasks. Naval aviation may also be retained for fleet defence and naval missions. Similarly, the Marine Air-Ground Task Force commander normally retains control of Marine organic air assets for direct support of his forces. However, sorties are made available to the JFACC for air defence, long-range interdiction and longrange reconnaissance. The Army, Navy and Marine Component Commanders also make available to the JFACC for tasking all excess sorties above those required for direct support of their forces. Operational control of assigned special operations aviation assets is retained by the Joint Force Special Operations Component Commander. These assets are tasked by the Joint Force Special Operations Air Component Commander who has no direct relationship with the JFACC. However, joint doctrine requires a close integration between special operations aviation and conventional aviation in order to avoid duplication of effort, make judicious use of both forms of air power, and achieve synergistic effects. To that end, a special operations liaison element resides within the JFACC headquarters.⁷



Some United States Air Force sources would contend that the distinction between special operations aviation and conventional aviation is an artificial one.

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Essentially, if a service component joint force structure is adopted, each service component commander would expect to retain operational control of his assigned air power assets. If one of the service component commanders is also designated the JFACC, he would also have tactical control of sorties made available by the other services. The doctrine requires that the component commander with the preponderance of aviation assets in theatre be normally designated JFACC. In the event that the Air Force Component Commander is not designated JFACC, the doctrine does not clearly delineate how Air Force assets would be controlled. If an Air Force component commander existed he could expect to retain operational control of his assigned assets. However, in that event, the way that Air Force assets would fit into an air campaign run by a non-Air Force JFACC is not immediately clear.

Even with the designation of a JFACC, American military air power is still not completely unified. Substantial army, navy and marine organic air assets do not come under the JFACC's control except in certain circumstances. One such circumstance is when the Joint Force Commander designates the JFACC as the supported commander for air defence, interdiction, and reconnaissance operations. At other times the JFACC gains control of air assets belonging to other services on an ad hoc basis at the discretion of the respective service component commanders. Essentially then, the command authority of the JFACC is limited. Indeed there is some argument about whether the JFACC has command status at all, particularly over assets which are not assigned or attached to his component. According to one view, rather than being a commander in his own right, the JFACC is more 'an executive agent' of the Joint Force Commander.⁸ This would appear to be borne out by the way the JFACC operated during the Gulf War, where his primary function was to coordinate and synchronise the application of joint air power.

Apart from allowing the concentration of air power in offensive operations, the most important outcome of this form of coordination is to deconflict air operations conducted by the various components. Deconfliction has two aspects. First, it minimises the incidence of fratricide that is always a worrisome possibility whenever there are multiple users of theatre airspace. The second aspect of deconfliction is that it helps avoid adverse interference between air operations and between air and surface operations that may be in progress concurrently. Deconfliction helps ensure that air operations complement one another and complement other theatre operations.

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Winnefeld, J.A., Niblack, P., and Johnson, D.J., A League of Airmen: U.S. Air Power in the Gulf War, RAND Project Air Force, Santa Monica, 1994, p 94.

The Joint Targeting Coordination Board

Target development is the key first step to planning an air campaign. United States joint doctrine gives the Joint Force Commander the option of setting up a Joint Targeting Coordination Board (JTCB). The function of a JTCB, if it is set up, would be to act as a target review board seeking to integrate at Joint Force Commander level target nominations from all components. The JTCB would provide a mechanism for resolving disagreements between the JFACC and other component commanders. In addition, the JTCB would deconflict air operations and those of special operations forces. The JTCB would be chaired by the Deputy Joint Force Commander, or by the Joint Force Commander's Chief of Operations. Members of the JTCB would include senior representatives from the Joint Force Commander's staff, senior representatives from each component as well as representatives from subordinate units, as required.

Joint doctrine does not mandate the formation of a JTCB, leaving its establishment to the Joint Force Commander's discretion. A JTCB at Joint Force Headquarters level was not set up during the initial stages of the Gulf War. The strategic targets compiled into a master target list had been developed before the war started. However, as the start of the ground war neared, and greater emphasis needed to be placed on commanders battlefield preparation, ground expressed increased dissatisfaction with the conduct of the battlefield preparation phase of the air campaign. Their primary complaint was that their nominated targets were not given adequate coverage in the daily Air Tasking Orders.⁹ In an effort to resolve this dispute, two and a half weeks before the start of the ground war, the Deputy Commander-in-Chief (DCINC) of Central Command was made responsible for reviewing the targets nominated by the ground commanders and apportioning effort. The DCINC then produced a target list which was separate from the master target list that had been produced before the war. The DCINC passed his target list to the JFACC for incorporation into the Air Tasking Order. Subsequently, the DCINC briefed the Commander in Chief (CINC), or Joint Force Commander, General Schwarzkopf. The ground commanders' nominated target list was thus modified three times daily; by the Component Commanders, by the DCINC and by the CINC.

The following discussion of the targeting process and associated issues has been extracted from Lewis, R.B.H, *Op Cit*, pp 4-21. See also Winnefeld, J.A., Niblack, P., and Johnson, D.J., *Op cit*, pp 81-85.





The JFACC Organisation

A JFACC organisation *per se* does not exist. The staff of the component commander designated JFACC forms the core of the 'JFACC organisation' with augmentees from the other components. Moreover, additional officers from the other components are sent to act as liaisons within the JFACC headquarters. A *notional* JFACC organisation, reproduced in Figure 4, was provided by the United States 13th Air Force by way of illustration.¹⁰

The bulk of the JFACC functions: air campaign planning, coordination, allocation and tasking; are staffed by the Operations Branch in the Air Operations Centre (AOC). There are two broad divisions in the AOC. The Combat Plans division would be responsible for long range air planning (two days out) and for preparation of the daily detailed execution order called an Air Tasking Order (see below). The Combat Operations division would oversee execution of the daily Air Tasking Order from the

¹⁰ Briefed by Lt Col J. Grasso and Lt Col B. Dodgen, HQ 13th Air Force, USAF at the RAAF/USAF Airman-to Airman Discussions on joint air operations and the JFACC concept, at RAAF Glenbrook, 14-15 February 1994.


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time it is promulgated. This division manages the Air Tasking Order amendment process. Intelligence staff support the functions of both these divisions.

US doctrine intends for the AOC to be manned by joint staff, although that was not how it turned out in the Gulf War. During that conflict, the AOC was essentially manned by Air Force staff augmented with staff from the other components. There were also component liaison staff within the JFACC's headquarters. However, the predominance of Air Force staff was a source of dissatisfaction to the other components. Joint staff employed in the AOC bears no relation to the Component Liaison staffs. The Component Liaisons are seconded officers from the other component commands. They are not part of the JFACC staff and do not have any staff functions, their role being to act in an advisory capacity. The liaison officers are advocates for their own services' requests for air support. They also perform a valuable and essential function in reviewing plans that task aircraft of their service.

Controlling Air Operations

During the Gulf War, the means used to coordinate coalition air operations was through the combination of the Master Attack Plan and Air Tasking Order (ATO). Both these concepts have since been written into JFACC doctrine. The Master Attack Plan defined the scope and content of the offensive part of the air campaign. Updated daily, it listed the targets, the times on target and the numbers and types of aircraft which would carry out each task.¹¹ The Master Attack Plan was a handy summary of the ATO, enabling one to grasp an appreciation of the overall campaign. Such a perspective was impossible to obtain from the depth of detail and bulk of the ATO. From the Master Attack Plan detailed planning for the execution of each task could be carried out and could be The ATO covered twenty-four hours of promulgated via the ATO. operations and was the principle device for allocating air effort.¹² The ATO assigned aircraft by type and numbers against targets and also gave:

¹¹ Winnefeld, J.A., Niblack, P., and Johnson, D.J., *Op cit*, p 136.

¹² **Allocation** in American military doctrine is defined as the translation of the Joint Force Commander's apportionment decision into total numbers of sorties by aircraft type available for each task. (JCS Pub. 3-01-2, p B-3, quoted in Winnefeld, J.A., Niblack, P., and Johnson, D.J., *Op cit*, p 94).

'instruction as to procedures, air space coordination, communications frequencies and call signs, search and rescue procedures, and targets precluded from attack, and it tasked non-combat and supporting missions such as airlift, escort, and refuelling'.¹³

Each day's ATO was evolved through dialogue with the tactical wings. This dialogue constituted 'a brokering session' that sought to balance operational requirements, capabilities and the operating practices rooted in the various services' air doctrine.¹⁴ After the first two days of the air war, development of the ATO became more difficult because of inadequate timely battle damage assessment. This, complicated by poor weather conditions and the *friction* inherent in warfare, resulted in a high number of incomplete sorties in the first ten days of the air war.¹⁵

The daily ATO covered most fixed-wing aircraft sorties in the theatre, including Navy and Marine aircraft, under the control of their respective component commanders. Rotary-wing aircraft operating below a ceiling of 500 feet and naval aircraft operating over water were exempt from JFACC control.¹⁶ Tasking information for Navy and Marine aircraft was provided to the JFACC staff by the respective component headquarters for inclusion in the ATO for deconfliction purposes. The resultant ATO was a voluminous document, often comprising 300 but sometimes over 900 pages on the Computer-Aided Force Management System (CAFMS). Consequently, transmission of the ATO was a tardy process made slower by the lack of compatible communications equipment between services. Transmission to Navy facilities was particularly affected often necessitating hard copy delivery.¹⁷

The ATO cycle was forty hours. Because of the size and complexity of the ATO, a large amount of that time was taken up in physically compiling and disseminating the document. Delays in receiving battle damage assessments and other intelligence reports had a significant

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¹⁶ Keaney, T.A., and Cohen, E.A., *Op Cit*, p 5.

¹⁷ Winnefeld, J.A., Niblack, P., and Johnson, D.J., *Op cit*, p 137.

¹³ *Ibid*, p 136.

¹⁴ *Ibid*, p 109.

¹⁵ Cohen, E.A., Gulf War Air Power Survey, Vol II, *Operations and Effects on Effectiveness*, US Government Printing Office, Washington DC, 1993, Chapter 3, pp 159-218.

impact on this process, occasionally leaving no option to the Air Operations Centre staff than to release delayed or incomplete ATOs.

The bulk of the ATO created major difficulties at the receiving end as well. It made it impossible for the wings to discern the overall plan embedded in the ATO. It also made extracting information from it particularly difficult and time consuming. In the post-war review. instances were reported of the ATO taking several hours to print out at locations where outmoded computer systems were in use. Affected units delay by obtaining their taskings would circumvent this bv communicating directly with the planning cell. Another criticism was that the ATO could not be all things to all men. Arising as it did, out of the Air Force experience of war with its centralised, theatre-level perspective, it appeared to non-Air Force commanders to be inflexible and ill-suited for fluid battle, such as that involving surface forces.¹⁸ To get around this problem, at least one commander, the commander of I Marine Expeditionary Force Airborne Command, resorted to 'gaming' the ATO.

'What I did was make it work for us - and I think the navy did the same thing - was write an ATO that would give me enough flexibility to do the job. So I might write an enormous amount of sorties ... and I might cancel an awful lot of those. This way I didn't have to play around with the process while I was waiting to hit a target.'¹⁹

Eventually, despite General Glosson's protestations, all Marine F/A-18s remained under Marine control.²⁰ Army commanders complained about not having their recommended targets appear on the ATO and about not getting a fair share of air support.

A most important exception to the general inclusion of coalition air operations in the ATO were those conducted by Proven Force. This force operated from Incirlik, Turkey, against targets in northern Iraq.²¹ Proven Force was an air task force formed as a composite wing, (7440th Combat Wing (Provisional)), from forces assigned from US Air Forces Europe. Hence, Proven Force was under US European Command

²¹ Winnefeld, J.A., Niblack, P., and Johnson, D.J., *Op cit*, p 136.

¹⁸ *Ibid*, p 138.

¹⁹ Moore, R.N. (Lt-Gen), 'Marine Air: There When Needed', US Naval Institute Proceedings, November 1991.

²⁰ Atkinson, R., *Crusade: the Untold Story of the Persian Gulf War*, Houghton Mifflin Co, New York, 1993, p 219.

operational control but came under the tactical control of US Air Forces, Central Command (CENTAF) and the JFACC. The mission of Proven Force was to open what amounted to a second air front in northern Iraq. Doing so prevented Iraqi forces from using this area as a sanctuary and also forced these forces to fight on two fronts, northern and southern Iraq.

After the first few days, JFACC headquarters did not include Proven Force tasks on the ATO. Instead Proven Force was advised of targets to be attacked in priority order. The size and composition of the force package, mission tactics and special instructions were left to the wing to work out. These arrangements allowed the flexibility and responsiveness of the composite wing structure of Proven Force to come to the fore. Proven Force was able to build its ATO within twenty-eight hours instead of the forty required by the JFACC staff. Although, some criticism was leveled at effectively creating a separate route package for Proven Force, the wing performed its limited task well.

Despite post-war criticisms and the logistic problems associated with its creation and dissemination, the ATO was successfully used to run a coherent air campaign in complex and difficuit circumstances. In the case of Proven Force, close integration and coordination with the remainder of the air operations was unnecessary. Proven Force operations were essentially in a separate area of operations. Hence, operating essentially with only targeting information allowed a measure of flexibility and responsiveness to be introduced into Proven Force operations. The much maligned route-package concept of the Vietnam era, in this case, was warranted by the clear geographic separation of the two areas of operation and the close cooperation with the JFACC controlled forces.

If the JFACC concept and ATO procedures had not been adopted, the only alternative would have been to revert to the discredited route-package approach of the Vietnam War era. In that war the airspace was divided along service lines and complex command and control structures applied. In that situation the risk of fratricide among friendly forces would have been much higher, and the complementarity of coalition operations would have been seriously degraded. Moreover, the Iraqis' ability to slip undetected into coalition airspace would have been greater if there were multiple airspace control authorities.

Assessment and Applicability to ADF Air Operations

Although the United States Marine and Army Components were not altogether satisfied with the JFACC concept, it was a successful means of coordinating diverse and numerous air power resources. The success of the JFACC during the Gulf War lay in three areas. First, the air campaign fought by the Coalition forces was successfully prosecuted having achieved the CINC's objectives. Second, there was good coordination of combat and combat support air operations. Finally, given the incredibly high usage rate of the airspace above the area of operations, the incidence of fratricide was remarkably low, testifying to the success of the deconfliction function performed by the Air Operations Centre.

In one respect, though, the workability of the JFACC system was never fully tested during the Gulf War. With such an abundance of air power available to the JFACC, his capacity to satisfy the requirements of the strategic air campaign, the interdiction and battlefield preparation requirement *and* the calls for close air support was never truly stressed. Hence, the major functions that the JFACC was called upon to perform were the coordination and deconfliction of air operations.

An ADF Air Component Commander would expect to face a totally different problem. His problem would be one of managing scarce air power resources. Hence, the issues of apportionment and allocation would occupy an ADF Air Component Commander, ahead of the coordination and deconfliction functions. However, in one sense the ADF Air Component Commander would have a simpler job than did the Gulf War JFACC. The latter had to tread warily in tasking air assets belonging to the other services. In the ADF's case the preponderance of air assets, including all combat fixed wing aircraft, are under RAAF command. Consequently, the nature of authority vested in the ADF Air Component Commander would not be subject to question in the same way that that of the JFACC was questioned. Nonetheless, in the ADF's case the Air Component Commander's advice to the operational commander with respect to apportionment and the assignment of air assets would be the subject of debate among the Joint Commanders at the operational level. Hence there is a need for a joint planning methodology which would focus all commanders on the achievement of the joint military objectives, ahead of their interest in conducting independent operations within their own environments.

CHAPTER SEVEN

AUSTRALIAN AIR POWER-THE SHAPE OF THINGS TO COME

Future air warfare will be affected by technological progress and also by developments in the strategic, political, economic and social spheres. While the majority of these developments occur outside the influence of the operational commander, they nonetheless have a significant impact on the conduct of war. It is, therefore, important to analyse the nature of these developments with a view to establishing how they are likely to influence future ADF air operations and the exercise of operational level commande.

Changes in the Geostrategic Environment

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The end of the Cold War and the collapse of the Soviet Union, at the close of the last decade, sparked a wave of euphoria around the world. Concurrently, though, there was an appreciation that the dawn of the post-Cold War era heralded new challenges as well as new opportunities. For all its attendant dangers, the Cold War and the prevailing bi-polar global balance of power, had an inherent stability and predictability. Regional tensions, ethnic and racial unrest, and territorial disputes were all overshadowed and restrained by the spectre of global war. Under the shadow of the Cold War less powerful states, such as those in South-East Asia, had one primary concern; that they would be drawn 'as unwilling proxies' into a super-power contest.¹

With the end of the Cold War the danger of such a contest has passed, but the potential for several other conflicts has arisen in its place. The erstwhile restraints on regional tensions and other disputes have been

Yeo Ning Hong (Singaporean Minister for Defence) 'Air Power: A Singapore Geopolitical Perspective', in Stephens, A. (Ed), *The War in the Air 1914-1994*, Air Power Studies Centre, Canberra, 1994, p 17.

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removed. Furthermore, there is a rising concern that the stabilising influence of the American military presence will be eroded as the United States reduces its forces based in Europe and in the Asia-Pacific region. In the latter region, there is some concern that a power vacuum may develop in the wake of American force reductions. The concern is twofold: that any number of the regional hot-spots may erupt into conflict; and that nations such as China or Japan may aspire to assume the mantle of a regional hegemon. These concerns are fuelled by the differences developing between the United States and Japan over economic and trade issues, and between the United States and China over human rights. Uncertainty over the future behaviour of North Korea, which in many ways is isolated from the region, is another cause for unease.

These concerns have the potential to translate into positive and negative outcomes. One positive outcome is an increasing interest in improving regional stability. This is being pursued through the building of diplomatic and economic ties among the rapidly growing economies of the Asia-Pacific countries. Economic interdependence is a major stabilising influence because it provides a commonality of interests between nations with disparate cultures and political ideologies. The second potentially positive outcome is the rising interest in extending the essentially economic relationships between countries of the region into encompassing political and cultural exchanges as well as a security dialogue. Foreign ministers from Asia-Pacific nations met formally for the first time in July 1994 to discuss regional security problems.² Although the only tangible outcome of this meeting was an agreement to continue this form of dialogue, the meeting offered the promise of more positive outcomes in the future. The ultimate objective of this dialogue is to develop means for reducing tension and building confidence in the Asia-Pacific region.

Even though this is a promising start, concern over destabilising influences in the region remains. This situation may have a negative impact on regional security. A state of uncertainty and fluidity prevails in the Asia-Pacific region at a time when the economic power of countries in the region is increasing and when there is a ready availability of technologically advanced weapons and weapons platforms. Hence, it is unsurprising that most countries in the region have availed themselves of

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Countries taking part in this meeting known as the ASEAN Regional Forum, included, China, the United States, Canada, Russia, Japan, South Korea, Vietnam, Laos, Papua New Guinea, Australia, New Zealand, the six ASEAN states, and senior representatives of the European Union. See Richardson, M., 'ASEAN Security Forum Takes First Small Step', Asia-Pacific Defence Reporter, October-November 1994, p 7.

the opportunity to initiate significant weapons upgrade programs. This has sometimes been interpreted as a regional arms race. There may be some justification for such an interpretation of the arms procurements by China, Taipei, Japan and the Koreas in North-East Asia, and those of India and Pakistan in South Asia.³ However, there is little basis for a similar interpretation of the arms upgrade programs within Australia's nearer region, specifically those of countries in South-East Asia.⁴ For there to be an arms race, there would have to be evidence that the arms procurement programs are interactive in nature. There is little, if any, evidence of this in South-East Asia.

While claims of an arms race in South-East Asia are highly speculative, there can be no denying that the weapons upgrade programs are giving countries in Australia's nearer region military capabilities that are greater in range and quality than was previously the case. Consequently, the technological advantage that Australia has had over her near neighbours in South-East Asia is being eroded. Moreover, there are indicators that the privileged access to American technologically advanced weapons systems that Australia has enjoyed to date will not continue. This is because some of the international controls on the trade in military technology are easing at a time when the American arms industry is facing a shrinking domestic market and is, consequently, seeking to expand its foreign customer base. Indeed, advanced combat aircraft such as F-16s and missile systems such as Harpoon have already been acquired by South-East Asian states. Furthermore, the strong economic growth and rapidly rising education levels in these countries will lead to an improvement in their ability to operate and support advanced weapons systems. This will in turn enhance the ability of our near neighbours to absorb further technologically advanced systems into their orders of battle.

As this situation evolves, Australia's technological edge will be increasingly difficult, if not impossible, to sustain. Thus for Australia and

³ Dibb, P., 'Australia's Regional Security policy in the 1990s', in Coulthard-Clark, C. (Ed), *The Qualitative Edge: A Role for Air Power in Regional Co-operation*, Air Power Studies Centre, Canberra, 1993, p 6.

⁴ Strategic Review 1993, Canberra, December 1993, (SR93), p 1 (footnote 1) defines the Asia-Pacific to be Australia's *region* and Australia's *nearer region* to embrace South-East Asia, the South West Pacific and the nearer reaches of the Indian Ocean. In this context the Asia-Pacific includes the 'Subcontinent, South-East Asia, North-East Asia and the South-West Pacific'. Similarly, South-East Asia 'comprises the six members of ... ASEAN, as well as Burma and the three countries of Indochina'. (See SR93 p 1, fn 1).

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the ADF the future holds significant challenges but at the same time offers several opportunities. The main challenge is how to provide for the defence of Australia at a time when the ADF's qualitative edge is under pressure and the global role of the United States is undergoing revision following the demise of the Soviet Union.

Australia is, happily, in the position of not being party to any dispute which is likely to lead to military conflict. That does not mean, however, that the ADF is unlikely to take part in military operations. On the contrary, ADF involvement in conflict either in the form of UN peace operations or as part of an international coalition is highly likely given the number of conflicts which are currently in progress and others which may emerge in the future. The nature and scale of future military operations may more closely resemble those which took place in Rwanda and those currently in progress in Bosnia, rather than a super-power contest. Alternatively, future military contests may resemble in nature, if not in scale, those of the Gulf War. Within Australia's region of the Asia-Pacific there are a number of territorial disputes which may lead to a military contest. Of the existing hot-spots the Spratly Islands in the South China Sea and the Korean peninsula are generally acknowledged to hold the greatest potential to lead to military conflict.

The Australian government's response to the challenge posed by the changes to our geostrategic environment has been to adopt a policy of defence self-reliance within a network of alliances. Central to this alliance network has been the alliance with the United States. However, given the increasing emphasis that that country is placing on its own wider economic interests and domestic concerns, Australia needs to be prepared for its status as an American ally to diminish in relative terms.⁵ This is not to say that a downgrading of the alliance is inevitable or even likely, rather, that there may be a realignment of the two countries' respective interests.⁶

The second plank of the Australian government's response to the challenge of providing for the defence of Australia has been to seek constructive engagement with the South-East Asian nations. Because Australia is not party to any significant dispute with her neighbours, few if any barriers hinder such an engagement. Australia's engagement with

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Dibb, P., *The Strategic Priorities for Australian Defence Industry*, Report to the Department of Defence, Strategic and Defence Studies Centre, Australian National University, Canberra, November 1992, p 23.

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South-East Asia may take several forms and, indeed, government policy is to add depth to the relationship with our neighbours. Hence, Australia is seeking to establish regional ties on several planes concurrently. These include diplomatic, economic, educational, scientific, cultural and military ties.

This policy of regional engagement opens up several opportunities for the ADF. To date the focus of military cooperation with the South-East Asian region has been on the maritime environment including the air dimension. Already RAAF P-3C Orion aircraft participate in maritime surveillance operations in the region. Moreover, there are a number of other links between the RAAF and South-East Asian countries. The Integrated Air Defence System in Malaysia and the training of Singaporean pilots in Australia being two examples. In addition, Singaporean air elements have participated in combined exercises with the RAAF and there is a standing deployment of a Singaporean Air Force squadron at RAAF base Amberley for training at RAAF air weapons Regional military personnel also undergo training in RAAF ranges. training establishments under the Defence Cooperation Program. It is also not inconceivable that the ADF could become involved in disaster relief in cooperation with other regional military forces. There is a potential to extend these links even further. For instance, Australia may potentially cooperate with ASEAN nations in UN and regional peace operations.

However, the creation of a regional military alliance either as an extension of ASEAN, as a separate organisation, is likely to be a very distant event. That is not to say that cooperative security in South-East Asia is an impossible goal. However, in this instance *security* would have to be defined in broad, largely non-military, terms. In its wider context, security would encompass aspects of diplomatic and socio-economic relationships, environmental protection, disaster relief, and the control of illegal activities such as piracy, smuggling and drug trafficking.⁷ Regional defence relationships are likely to continue on a bi-lateral rather than a multi-lateral basis.

Although a regional multi-lateral security alliance is unlikely to eventuate in the foreseeable future, the evolving strategic environment indicates an increasing level of contact between the ADF and its South-East Asian counter-parts. In terms of air power, areas where this contact is likely to expand include; participation in combined exercises, personnel

Major General Datuk Ahmad Merican, 'The Malaysian View of the Regional Cooperation Prospects', in Coulthard-Clark, C. (Ed), Op cit, p 22.

exchanges, an interchange of ideas through personal and more formal contacts, bi-lateral cooperation in maritime surveillance, and possibly through an extension of the current Integrated Air Defence System to involve other South-East Asian countries. There is already significant contact and an active exchange of ideas in a range of areas including doctrine development between the RAAF and the regional air forces. An aspect which will facilitate these contacts between the RAAF and our nearer region is for selected RAAF personnel to train in the language and culture of our near neighbours.

The Political and Economic Outlook

Australia's political and economic outlook to a significant extent will affect the degree of engagement with the region. Although a degradation of the political stability Australia has enjoyed to date is unlikely, developments in the political, economic and social spheres will continue to impact upon the ADF. During periods of economic recession, such as Australia has experienced in recent years, and without a readily identifiable threat to our security, the Government is under pressure to shift funding priorities. In these circumstances, increased priority to funding employment growth and social security programs can be expected. Political pressure exerted upon the Australian Government has increased as a result of the rising influence of minor political parties and special interest community groups. The ability of such agencies to influence Government policy development was particularly evident in the parlous passage of the 1993-94 budget through the political process. Hence, given the current political and economic environment, future budget allocations to defence as a proportion of Gross Domestic Product in all likelihood will remain steady or exhibit a downward trend. This is likely notwithstanding the expectation in the current Defence White Paper of defence funding remaining at approximately 2 per cent of GDP.⁸

Moreover, the savings generated within the ADF through initiatives such as the integration of single service functions, the Commercial Support Program and reductions in the number of uniformed personnel will rapidly be absorbed by rising costs. One such rising cost is salaries and conditions of service. A review of the ADF pay structure is currently in progress. Additionally, the cost of providing air support to the Australian Army and Navy will increase as a result of force structure initiatives by these services. The Australian Army is moving an increasing

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Defending Australia: Defence White Paper 1994, Australian Government Publishing Service, Canberra, 1994, p 146, para 14.5.

number of units to the north of Australia and the Navy has adopted a twoocean basing policy. Both these initiatives will place additional demands on RAAF aircraft entailing an increase in aircraft flying hours in providing air support.

Constraint in financial resources has significant implications for Australian air power. Both the F-111 and F/A-18 aircraft will reach the end of their useful lives within the next 25 years. The procurement of C-130J aircraft to replace the ageing Hercules C-130E fleet has already been approved. The Macchi lead-in fighter will likewise reach the end of its life by the end of this century. The development of air power force structure post these aircraft is a question that is already starting to occupy the RAAF. It is not a case of merely procuring new aircraft to replace the F-111 and F/A-18 as they become obsolete. The issue is deeper than that. First there is a need to assess the range of air power capabilities that will be needed in 25 years time and beyond. This involves evaluating how our strategic environment will evolve over that time and the likely roles that Australian air power will be required to perform. It also entails assessing the platforms and technologies that will be available and their affordability as well as the ADF's capacity to acquire, support and exploit them. A problem faced by the RAAF is that the Department of Defence and Headquarters ADF base their force development planning on a rolling ten year program. Consequently, any longer-term air power development planning that needs to be carried out, is done of necessity without guidance from these authorities. With the release of the 1994 Defence White Paper the level of uncertainty associated with short-term planning has been reduced because the government has announced that 'from 1996-97 it will provide defence with a five-year budget commitment'.⁹ However, the existing uncertainty with planning for the longer term remains, although tentative steps have been taken to develop long-range plans.

The affordability of new platforms and technologies is a vital consideration for any defence force. A historical review of aircraft acquisitions shows that there are two inexorable trends; successive generations of aircraft have an increasing unit cost, and this is matched by a declining fleet size.¹⁰ The rising trend in unit cost is associated, at least in part, with a rise in complexity from generation to generation.

Ministerial Statement by the Minister for Defence the Honourable Robert Ray, 30 November 1994.

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Wilson, A.J., 'The Future of Air Power: An Industrial Perspective', *The Hawk Journal*, 1993, p 54.

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However, the cost of ownership is not only that associated with acquisition, but also includes the operating costs. Increasing complexity in aircraft and weapons systems requires technically advanced maintenance and repairs procedures which rely on the development and maintenance of technical facilities and skills. Acquisition and operating costs may be minimised by careful design and by increasing production efficiency. Other means for reducing the cost of ownership is to enter into collaborative arrangements with other regional defence forces for the purpose of joint procurement programs and the establishment of joint technical facilities. Significant cost savings are possible through such ventures.

However other, more radical, force structure solutions such as the use of unmanned air platforms and one-shot systems (an example of which is the Tomahawk Land Attack Missile) need to be investigated. The benefit of unmanned aerial vehicles is that the weight penalty of carrying aircrew and life support systems is eliminated. Hence, air platforms can be built which are smaller, achieve greater speeds, carry greater payload and have a greater range and endurance than manned aircraft. Inherently less complex, such air platforms are also cheaper than manned aircraft. Another radical approach would be to reconsider the need for highly capable multi-role, multi-mission (and hence highly expensive) aircraft. The solution may lie in optimising the mix of manned/unmanned, complex/non-complex platforms. The cost-effectiveness of space-based systems also needs to be investigated. This is potentially one area of cooperation between Australia and countries in our nearer region. Cooperative space-based surveillance systems could be used to monitor illegal activities such as piracy and drug trafficking, as well as for subsequent military use in a contingency.

Irrespective of the approach adopted, any reductions in the cost of ownership of air platforms could be reflected in larger fleet sizes. The size of combat aircraft fleets is one parameter which determines the credibility of the force. Fleet size determines the degree to which concurrent air operations, a fundamental plank of air doctrine, are possible and whether a critical mass of air power can be employed in concurrent operations. In Australia's case, air fleet size is a particularly important consideration given that the area of direct interest to our defence is vast, covering 10 per cent of the earth's surface.¹¹

With such a large area to cover it is inconceivable that ADF air power resources will not be stretched during a contingency. Arguably, a

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Defending Australia: Defence White Paper 1994, Op cit, p 14, para 3.7.

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scarcity of air resources is the single unchanging attribute that has characterised air power throughout its history. The existence of an indigenous industrial and scientific support infrastructure would go at least some of the way towards ensuring that the necessary air power assets are available when required. However, such an infrastructure is also expensive to maintain. Few countries can afford to be self-sufficient in air power. The only course open to the majority of countries which are unable to achieve self-sufficiency, is to procure major assets overseas while maintaining a limited in-country aerospace industrial and scientific capability. The cost of employing and training operational and support personnel is also very high. In times of peace it is common for countries to maintain smaller forces. This also has been a feature of ADF force structure. The idea being that when the need arises, the forces-in-being can be augmented through the use of reserves and new recruits.

At first glance the scheme of expanding air power assets, weapons holdings, and personnel levels as the need arises would appear to be a cost-effective option. However, this approach is underpinned by the assumption that additional assets of an appropriate nature and quantity will be obtainable within the time frame required. Consequently, the assets procured for the force-in-being are often those necessary to satisfy peace-time operational and training needs, and not those required for credible contingencies. Even if there is absolute assurance that in times of emergency the required support will be available either from indigenous or foreign sources, there remains the problem of expanding the force-in-being to meet contingencies. Force expansion entails training additional aircrews, maintainers and support personnel. It could also involve the acquisition of additional assets, possibly including new capabilities in the use of which there is little or no previous experience. All of this takes time.

Inherent in the force expansion concept is the belief that intelligence agencies will provide adequate forewarning of impending contingencies, and that strategic planners will heed the warning. The assumption is that the warning time thus provided will exceed the force preparation time. The concept of warning time is a well tried one; it was the basis of British defence budget planning throughout the 1920s. The British Government, having decided to drastically reduce the defence forces of World War I, at Churchill's urging, introduced the 'ten year rule'.¹² This rule assumed that 'no great war is to be anticipated in the

Dick, R., 'Confronting Complacency: The RAF Girds for War, 1933-1939', Air Power History, Vol 41, No 1, Spring 1994, p 23.

next ten years'.¹³ Coincidentally, a similar warning time underpins Australian defence planning. The current Defence White Paper postulates that:

No country in Asia has developed the forces required to mount a major conventional attack on Australia sufficient to seize and hold significant territory on our continent. ... Military capabilities on this scale cannot be developed in secret. We are confident that our intelligence would detect at an early stage the development of such forces. We know from our own experience that the capabilities required could not be developed from the existing low base in much under *a decade*.¹¹⁴

The White Paper goes on to acknowledge the possibility of short-warning conflict although it envisages that such conflict would be of relatively low intensity and would be within the capability of the force-in-being to counteract. To enable this to be done, defence '*planning focuses on capabilities rather than threats*'.¹⁵ However, as noted by the White Paper, the nature, sophistication, reach and effectiveness of military capabilities in our nearer region are increasing rapidly. The ability of the ADF to react to a rising threat, even in the short-warning scenario would rely on the availability of timely warning.

The problem with the concept of warning time is that past experience has shown a singular propensity for contingencies to arise without expectation. This has occasionally occurred because intelligence agencies have misinterpreted the indicators which in hindsight would appear to have provided evidence of the evolving emergency. Failure to achieve the desired warning time also can result from a reluctance by governments to react to anything but the most incontrovertible of evidence. A fear of exacerbating the situation and a reluctance to commit funds and forces without clear need causes governments to adopt a conservative stance. The problem is that the longer one waits to be sure, the less time there is to prepare for the crisis that may arise. There are several recent examples of security crises which appear to have occurred

¹⁵ *Ibid*, p 22. (Emphasis in the original.)

¹³ Loc cit.

¹⁴ Defending Australia: Defence White Paper 1994, Op cit, p 23, paras 4.8 to 4.10. (Emphasis added.)

without adequate warning. These include the 1979 Iranian revolution, the first coup in Fiji in 1987 and the 1990 invasion of Kuwait by Iraq.¹⁶

In the latter instance, the Coalition forces were able to use the duration of Operation DESERT SHIELD to prepare for war. During this period, air power was used to provide some defensive capability while the rest of the force took several months to assemble and prepare for operations. In essence, then, the preparation time available to the Coalition forces was little more than six months. It was sheer luck that in early 1990, American Central Command (CENTCOM) had reoriented its threat assessment to take into consideration the emergence of regional conflicts in the Middle East. CENTCOM ran Exercise INTERNAL LOOK 90, a command post exercise based on such a contingency, barely a month before the invasion of Kuwait.¹⁷

As well as depending on the capacity to expand the force-inbeing, the availability of ADF air power is also dependent on resupply from foreign sources. The approach of relying on foreign supply sources has been and continues to be fundamental to Australia's defence procurement policy. Australia, secure in the strength of her long-term alliance with the United States, places great reliance on the availability of war fighting materiel from that country. However, there is an inherent risk in the assumption that in times of emergency materiel assistance of the type and quantity required will be available in the necessary time-frame.

There are several reasons why a supplier nation may not be in a position to satisfy such demands. For one, government policies may have caused a strain in the alliance relationship. An example is the cooling of relations between New Zealand and the United States, which followed the New Zealand Government's ban on the visit of nuclearpowered and nuclear-armed ships. As a direct consequence of this policy, and despite the longevity of the alliance between the two nations, the United States suspended defence relations with New Zealand. Although, the unwillingness of the United States to provide support to New Zealand in the event of a contingency has never been tested, the latter cannot

¹⁵ Stephens, A., 'The Defence of Australia', in Stephens, A. (Ed), Defending the Air/Sea Gap: Exploiting Advanced Technology and Disproportionate Response to Defend Australia, Australian Defence Studies Centre, Canberra, 1993.

¹⁷ A command post exercise (CPX) is a war game in which headquarters staffs practice running a campaign. A CPX does not involve actual forces, rather headquarters staff rehearse campaign planning, coordinating component forces manoeuvres, and directing logistics.

place any reliance on such support being available. Nor has the Australia-United States relationship been one of uninterrupted harmony. In the dispute over West Irian, the United States, obeying its own wider interests, supported the Indonesian position and not that of Australia. More recently, the United States has adopted aggressive trade practices which have run directly against Australian interests. While the defence relationship between Australia and the United States has not been adversely affected, these instances are clear evidence that the interests of the two allies will not always coincide. Where interests diverge, a nation will pursue its own interests ahead of those of even its closest allies.

A further reason why materiel support may be withheld during contingencies is that supplier nations may elect to apply political leverage. The arms embargo is not uncommon and is not new to Australia. During the Vietnam War Sweden refused to supply Carl Gustav 84mm anti-tank rounds to the Australian Army.¹⁸ There were also concerns that the French would have refused to support Mirage operations in Vietnam had they been conducted.¹⁹

Even when relations between customer and supplier nations are harmonious, it is possible for the parties in conflict to be competing for support from the same supplier. In such a situation, the supplier nation may chose to support none of the belligerents or may chose to side with one or the other. In either case, both parties to the conflict are open to political interference. There is also the possibility that the supplier nation itself may be engaged in conflict and may be unwilling to release arms support to a third party. Australia's own experience during World War II provides a lesson of the risk associated with depending on foreign supply sources. Faced with the threat of large scale attack and invasion by the Japanese, the Australian Government made repeated attempts to obtain front-line combat aircraft from the United Kingdom. These efforts of the Australian Government went unrewarded because the United Kingdom considered its own needs for aircraft and those of the Soviet Union to be of higher priority.

To the operational commander, the concept of warning time is of little relevance. In actuality there is often very little warning or time for

Ibid.

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¹⁸ This information was kindly provided by Dr Chris Coulthard-Clark and will be documented in his forthcoming volume of official history dealing with RAAF operations in Vietnam. Source documents for this information were Australian Air Board Submissions 57/67, 63/67 and 9/68.

preparation. In a contingency, one can count only on having available existing forces and war stocks. In the case of air power, such forces will be limited because of the cost involved in acquiring, maintaining and operating such assets. Where reliance is placed on resupply from foreign sources, there is no guarantee that assets of an appropriate nature and quantity will be obtainable in the time frame required. Hence, the endurance of air power operations may also be limited.

In such a circumstance, the application of this scarce resource becomes a primary concern for the operational commander. Two of the key air power characteristics, responsiveness and flexibility are important force multipliers which the commander can exploit. However, the responsiveness and flexibility of air power are not immutable qualities. Force structure and military doctrine are important determinants of the degree to which air power is responsive and flexible. Force structure determines the nature of air power capabilities that are at the commander's disposal. Doctrine establishes the framework for the employment of those capabilities.

Medium powers, such as Australia, whose air resources though highly capable are small, are vulnerable in two situations; being drawn into mounting a disproportionate response, or becoming involved in protracted operations conducted over dispersed areas. In both these scenarios the danger is that unsound employment of scarce resources such as air assets, will significantly limit the endurance of the ADF. Hence, the role of the operational air commander is to ensure effective employment of air assets. This is done through the commander's air power apportionment decision, the assignment of forces and through the creation of an effective command and control structure.

A study of past campaigns is highly instructive in this regard. As was discussed in Chapter 5, the key lesson for the effective employment of air power is the need to ensure unity of effort not only between air operations but unity between operations in all environments. Essential to unity is a command organisation that has clearly delineated lines of authority and definitions of responsibility. Equally essential is a command structure that facilitates integrated operations. In terms of the employment of air power, past experience instructs that the most effective arrangement is to have centralised control. The implication of centralised control is that there is centralised setting of priorities for the apportionment of air effort. However, the degree of control needs to be such as to allow a measure of flexibility at the tactical level.

Air Power as a Political Tool

A major determinant of the type of air operations that may be authorised will be the nature of the strategic guidance provided by the political leadership. From its origin air power had a political impact. The increasing speed and range of aircraft has changed the perception of distance separating countries. During World War I, aircraft reached speeds of less than 200 kilometres per hour and had a range of 500 kilometres. By World War II, aircraft speeds had increased by a factor of four and ranges had improved by more than an order of magnitude. These developments in aviation (together with the advent of submarines) challenged tendencies to isolationism by stripping away the protection previously offered by natural barriers such as the sea. As one American writer pointed out:

'Our [America's] geographical position no longer offers its former great depth of defence - the security both of distance and of the buffer states of western Europe - since air attack can be brought to us through the stratosphere and without regard to distance and intervening neutral or belligerent territory.²⁰

Progress in technology has enhanced existing air power capabilities and introduced new ones. Air platforms of ever greater speed, range and striking power are being developed. Air-to-air refuelling has given aircraft the ability to reach any part of the globe. Indeed, during the 1991 Gulf War, a number of air missions against Iraq were launched from, and recovered to, the continental United States.²¹ The net effect of such technological progress is that air power, at relatively short notice, can reach deep inside enemy territory and strike with precision, while posing a low risk to own forces and civilians. Because of these attributes air strike is an attractive political choice in situations where low risk operations involving a relatively small effort are desirable. Australian defence policy allows for the possibility of carrying out strategic strikes in certain circumstances.²²

An example of a long-range air mission with a political message was Operation ELDORADO CANYON, the 1986 American air raid

²⁰ Earle, E.M., 'Influence of Air Power', in Emme, E.M., *Op cit*, pp 106.

²¹ Tirpak, J., 'The Secret Squirrels', *Air Force Magazine*, The Air Force Association, April 1994, pp 56-60.

²² Defending Australia: Defence White Paper 1994, Op cit, p 24, para 4.12.

against Libya.²³ The parameters laid down for this operation were that, it should deliver a strong message to the Libyan government while minimising the risk to Libyan civilians and American aircrews. These guidelines led to a decision to launch simultaneous attacks against selected targets of a military significance with the intention of producing high visibility damage. F-111 aircraft stationed in the United Kingdom and carrier-based aircraft in the Gulf of Sidra were used to deliver 2 000 pound laser guided bombs. The operation did not have strong international support. Britain was the sole major European ally of the United States to back the use of force on this occasion. Both Spain and France were unsympathetic to the United States request for over-fly rights making the route-to-target distance 2 500 instead of 1 300 nautical miles.

For operational commanders the political dimension of air power presents several challenges. Arguably, the most serious of these is the likelihood that the application of air power will be subject to close military controls and constraints. The nature and extent of political constraints will vary depending on the situation and on the political leadership. The mere exercise of political control is not problematic. On the contrary, the operational commander needs clear political guidance in order to ensure that military operations support the national objectives. However, a problem can arise when the political leadership makes demands that are 'militarily improper' or operationally unsound. The use of limited air strikes against the Serbs in the Bosnian conflict is one such example; the conduct of the early part of the Vietnam War was another.

The operational commander needs to be aware of the potential for political control of operations and be prepared to show the possible consequences of the proposed military action under the given constraints. Naturally, though, political direction will prevail. However, this circumstance does not relieve the commander's obligation to explain the operational shortcomings and negative consequences of unsound employment of air power.

Air Power and the Media

In addition to its political impact on the international scene, the employment of air power has implications on a domestic level. In

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Doerner, W.R., 'In the Dead of Night', *Time*, 28 April 1986, pp 28-31. Also Aviation Week and Space Technology, Editorial, 'US Demonstrates Advanced Weapons Technology in Libya', 21 April 1986, pp 19-20.

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democracies, the public, through its support or otherwise, of military policies can significantly influence government decisions relating to defence policy and the conduct of military operations. A clear example of direct public influence on defence policy was the Australian moratorium movement of the early 1970s. The movement, led by Dr Jim Cairns, was influential in mustering public support and contributing to the electoral defeat of the Liberal Government. The incoming Whitlam Labour Government repealed conscription and ordered the withdrawal of Australian troops from Vietnam. A parallel example was the American public's active opposition to the Vietnam War. In the face of mounting public opposition the Nixon administration sought disengagement from the conflict.

The presence of media representatives in the theatre of operations is now a fact of life. But particularly since the intrusion of the electronic media onto the battlefield, the ability of correspondents to inform and influence public opinion has increased. Through the eye of television, the horror of war gained an immediacy that had previously been experienced only by those actually in the war zone. During the Vietnam conflict, the first 'television war', the public not only witnessed the effect of operations on the Vietnamese people and landscape, but also saw at first hand the dead and wounded soldiers.

Inept handling of the media has great potential to erode public morale and support for operations and by extension affect troop morale. Hence, the operational commander cannot afford to ignore either the problems or the opportunities presented by media coverage of the conflict. The most immediate problem that the media can present is the sheer volume of reporters wishing to go into the field. Apart from the disruption such excursions can cause, resources are often consumed in providing accommodation, escorts, transportation and communications. By the time Operation DESERT STORM began, 1 600 media representatives had massed in Saudi Arabia and at least on one occasion a USAF C-141 cargo aircraft was used to transport news personnel to Saudi Arabia.24 For the purpose of covering the war, a media pool system was arranged whereby 159 reporters accompanied combat units; 27 aboard American ships or on allied air bases, and 132 with US ground units.²⁵ During the Falklands War reporters, having no safe, independent means of travelling to and staving in the theatre of operations, travelled with the British task force.

Ibid, p 22.

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²⁴ Conduct of the Persian Gulf War, Op Cit, pp 651-652.

Hence, it is not a question of whether media representatives will be there, it is more a question of how many will be there and how will they interfere with the conduct of operations. When on the night of 9 December 1992, a United States Marine Reconnaissance Force conducted what they had hoped would be a covert amphibious landing onto the beach in Somalia, television crews were already in place to illuminate and film the landing party.²⁶

Moreover, it is not a question of *whether* they will report any newsworthy item that comes their way (officially or unofficially), but *in what context* they will report it. On 13 January 1993, at 2.30 pm, a White House spokesman announced an attack by allied aircraft against air defence facilities in southern Iraq which had taken place just one and a quarter hours earlier. He was in fact not providing new information because news of the launch of the air attack had been broken two hours earlier by the Reuters News Service which had obtained the information from a 'source' in Washington.²⁷

From the foregoing examples, it will be seen that the media shares with air power the attribute of ubiquity. Another characteristic in common with air power is the media's access to technologically advanced equipment. During the Gulf War, the television networks demonstrated the capability to broadcast images obtained from satellite over-flights.²⁸ Attempts to control access to such images would be futile. Indeed, television networks in the future may have observation satellites of their own looking down on the battlefield. Moreover, technology is already producing smaller cameras, editing equipment and satellite link stations. Therefore, it is only a matter of time before the pallet-loads of equipment such as those transported to the Gulf will be replaced by man-portable briefcase size packs. These advances will increase the access to information, mobility and the extent of coverage able to be provided by the media. This will make restriction of media access a thorny issue to be debated by governments as the media becomes increasingly intrusive. The most serious concern relating to media operations is the potential breakdown of operations security. An example of such a breach during the Gulf War, was a news report which revealed that Coalition airborne

⁸ *Ibid*, p 15.

²⁶ Ricks, C.W., The Military-News Media Relationship: Thinking Forward, US Army War College, Strategic Studies Institute, Carlisle Barracks, Pennsylvania, 1 December 1993 pp 14, 21.

²⁷ *Ibid*, p 22.

targeting systems were hampered by smoke. After this report, the Iraqis took up the practice of placing smoke generators around tank revetments.²⁹

It would be futile to attempt to exclude the media from the theatre of operations. It would also be counter-productive to adopt a hostile approach to dealing with the media. What is needed is the establishment of procedures whereby the public's right to know about the conduct of military operations is respected while the need to maintain operational security, and the safety and privacy of servicemen and women. is satisfied. The implication is that operational commanders should be pro-active in preparing to include media coverage of operations. This would ensure that news correspondents make informed interpretations of the news items they present and ensure it is presented in the correct context. A pro-active approach entails having negotiated rules regarding the provision of access to commanders, combat and support forces, imagery and other information. Moreover, operational commanders would need to ensure that appropriately trained media staff are available to handle media enquiries. Such a move would remove some of the burden on commanders.

In order to maintain security, an embargo system would need to be agreed whereby release of sensitive information briefed to the media is delayed until security concerns no longer apply. Associated with such a system, would need to be a referral procedure to handle disputes and also a means of dealing with breaches of security.

Used properly, media coverage can be of benefit. Media coverage has the potential to show the human face of armed forces. It can portray the military in a positive way as the highly professional, dedicated people they are. Media coverage also can help the public see that their support is important to the servicemen and women who are working under stressed conditions in dangerous environments. When the media, through providing a positive view of the armed services, generates popular support, it is a magnificent boost to troop morale.

These outcomes will not occur if preparations and negotiations are not made before the war starts. Another important element is the training of commanders at all levels to handle contact with the media. Such training can be, and often is, incorporated into officer staff courses. However, a more realistic form of training would be to

²⁹ Norris, G., 'USAF/Navy to Check Gulf War Weaknesses', *Flight International*, 18-24 September 1991, p 10.

exercise the media liaison function in command post and operational exercises. In the words of one writer:

'Ultimately, of course the goal is that the next time the lights come on, either literally or metaphorically, the situation will be interpreted as an opportunity to tell the military story, and that the soldiers, regardless of position, will be trained well enough to respond candidly, explain effectively, and continue the mission.'³⁰

Air Power and Non-Lethal Weapons

In many respects public reaction to media reports of the destruction and carnage associated with war is instrumental in giving an impetus to a number of new technological advances. Death and destruction are becoming less and less acceptable to society at large, even if they are the outcomes of just wars. One of the new technologies is the development of non-lethal weapons (NLWs). The Iraqi practice of embedding military facilities within civilian populations, locating vital military equipment among religious shrines and using human shields has generated an increased interest in NLWs as a means of minimising civilian casualties and collateral damage. The interest in non-lethal technologies was further heightened by the large number of civilian deaths (between 7 000 and 10 000 according to some reports) as a result of UN peace operations in Somalia.³¹

Apart from a desire to minimise innocent death and unnecessary destruction, NLWs could be used to immobilise moving targets thereby making them more vulnerable to conventional lethal weapons. Alternatively, immobilising technologies could be useful in a situation such as in the former Yugoslavia where non-lethal means could be employed to inhibit the movement of aggressor forces without engaging in full-scale combat. For this reason NLWs are an important development for air warfare because they create a new lower level in the escalation ladder which gives an operational commander the opportunity to take offensive action without resorting to the use of lethal force.

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'Less Than Lethal', International Defense Review, 7/1994, p 29.

³⁰ Ricks, C.W., *Op Cit*, p 36.

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Few NLWs technologies have reached advanced development.³² Nonetheless, research in the United States and elsewhere is gaining momentum. The technologies under consideration range from high technology laser weapons and computer viruses to relatively simple compounds that could be used to foul engines and air intakes. Figure 1 summarises some of the NLWs technologies applicable to air power, either as air deliverable weapons or as weapons that may be used against air assets.³³

The employment of NLWs would present special challenges. The legality of targeting civilian populations using even non-lethal means needs to be examined. Furthermore, there needs to be an awareness that some of the technologies currently being researched could be deemed to violate international conventions. For instance, if an agent is poured into enemy fuel supplies to render them unusable or to cause fouling of engines, it could be considered to be a form of chemical or biological warfare. Moreover, the International Committee of the Red Cross has raised concerns about the use of lasers as blinding weapons.³⁴ Also there needs to be an awareness of the potential for environmental contamination by widespread use of chemical agents used in NLW applications.

The second challenge posed by NLWs particularly affects intelligence operations. The nature and detail of targeting information required for the application of NLWs would differ markedly from that necessary for conventional lethal systems. In some instances NLWs also require greater delivery precision than lethal systems in order to produce the desired effect. Moreover, battle damage assessment (BDA) would be a particularly complex task requiring innovative intelligence gathering and analysis techniques. A further challenge of NLWs is that of developing effective counter-measures against enemy use of NLWs in offensive and defensive operations.

The adequate employment of NLWs will rely in part on the existence of doctrine which effectively integrates the employment of NLWs with conventional lethal weapons. The use of NLWs should also

³² **Non-Lethal Weapons** are those designed to disable, dazzle or incapacitate systems, or personnel to prevent their normal function.

³³ 'Less Than Lethal', *Op cit.*, pp 29-44.

³⁴ Blinding Weapons, Reports of the Meetings of Experts Convened by the International Committee of the Red Cross on Battlefield Laser Weapons, 1989-1993, ICRC, Geneva, 1993.

NLW Typye/ Role	Air Defence NLWs	Anti-Air NLWs	Air Delivered NLWs
Anti- Infrastructure			Electrical power distribution munition - Metallic Chaff deployed against power lines causing major shorting. Used in Gulf War against Iraqi power grid.
Anti-C ⁴ I		Computer virus weapon	Non-nuclear electro-magnetic pulse weapon - delivered by cruise missile.
Anti-Sensor	Low energy laser - used to harass enemy aircrew. Currently in use on RN ships.		Night vision technology. Light detection and ranging.
	High powered microwaves - high energy system used for point defence of fixed installations against missile or aircraft attack		
Anti-Mobility		Liquid metal embrittlement.	
		Combustion alteration technology.	
		Chaff - eg ceramic particles for ingestion by aircraft engines.	
		Anti-traction technology - for runway denial.	

Figure 1. Survey of NLWs Affecting Air Power

Australian Air Power - the Shape of Things to Come

be supported by intelligence and command and control arrangements. Associated with the development of doctrine, there is a need for appropriate training and simulation facilities and procedures.

Directions in Technology

Advanced technology often confers operational advantage even to a numerically inferior force. Moreover, technological improvements can potentially reduce operating costs through improvements in the reliability, maintainability and supportability of air platforms. Australia as a technologically developed nation has the ability to make judicious, costeffective use of technology to enhance the ADF's ability to defend Australia and its territories. Key areas in which Australia will need to develop and maintain excellence have been identified to be:

- . intelligence collection, evaluation and distribution;
- . surveillance and reconnaissance;
- . command and control
- . key weapons and sensors
- electronic warfare.³⁵

Australia imports most of the technology supporting its defence capabilities. Indeed, the United States is a primary source of Australian operational air assets. Therefore developments in American defence related technologies are of particular interest. The United States Department of Defense has identified 22 critical technologies which are listed in Figure 2. These should be assessed for applicability to the ADF.

Certain characteristics of the Australian environment necessitate that imported equipment be tailored for ADF use. In addition, there is a need for some indigenous development. Accordingly, while Australia does not need to be technologically self-sufficient, there is a need to monitor foreign technological developments to determine their applicability to the ADF and the degree to which they would need to be tailored to the Australian environment. In addition, Australia may need to

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Defending Australia: Defence White Paper 1994, Op cit, p 27.

Critical Technology	Objective
1. Microelectronic Circuits and their fabrication	The production of ultra-small integrated electronic devices for high-speed computers, sensitive receivers, automatic control, etc
2. Preparation of Gallium Arsenide (GaAs) and other compound semiconductors	The preparation of high purity semiconductor substrates and thin films for microelectronic substrates
3. Software producibility	The generation of affordable and reliable software in timely fashion
4. Parallel computer architectures	Ultra-high speed computing by simultaneous use of all processing capabilities in the next generation of computers
5. Machine intelligence/robotics	Incorporation of human "intelligence" and actions into mechanical devices
6. Simulation and modelling	Testing of concepts and designs without building physical replicas
7. Integrated optics	Optical memories and optical signal and data processing
8. Fibre optics	Ultra-low-loss fibres and optical components such as switches, couplers, and multiplexers for communications, navigation, etc
9. Sensitive radars	Radar sensors capable of detecting low- observable targets and/or capable of non- cooperative target classification, recognition, and/or identification

Figure 2. US Department of Defense Critical Techno
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³⁶ US Department of Defense, *Critical Technologies Plan*, Washington, DC, 15 March 1990, 1 May 1991. Reproduced in Shultz, R.H., and Pfaltzgraff, R.L. (Eds), *The Future of Air Power in the Aftermath of the Gulf War*, Air University Press, Maxwell AFB, Alabama, July 1992, pp 336-337.

Critical Technology	Objective
10. Passive sensors	Sensors not needing to emit signals to detect targets, monitor the environment, or determine the status or condition of equipment
11. Automatic target recognition	Combination of computer architecture, algorithms, and signal processing for near real-time automation of detection, classification, and tracking of targets
12. Phased arrays	Formation of spatial beams by controlling the phase and amplitude of radio-frequency signals at individual sensor elements distributed along an array (radar, underwater acoustic, or other)
13. Data fusion	The machine integration and/or interpretation of data and its presentation in convenient form to the human operator
14. Signature control	The ability to control the target signature (radar, optical, acoustic, or other) and thereby enhance the survivability of vehicles and weapons systems
15. Computational fluid dynamics	The modeling of complex fluid flow to make dependable predictions by computing, thus saving time and money previously required for expensive facilities and experiments
16. Air-breathing propulsion	Light-weight, fuel-efficient engines using atmospheric oxygen to support combustion
17. Pulsed power	The generation of power in the field with relatively light-weight, low volume devices
18. High-power microwaves	Microwave radiation at high power levels for weapons applications to temporarily or permanently disable sensors or to do structural damage

Figure 2. Continued

Critical Technology	
19. Hypervelocity projectiles	The generation and use of hypervelocity projectiles to (1) penetrate hardened targets and (2) increase the weapon's effective range
20. High-temperature/high- strength/Light-weight composite materials	Materials processing high strength, low weight, and/or able to withstand high temperatures for aerospace and other applications
21. Superconductivity	The fabrication and exploitation of superconducting materials
22. Biotechnology materials and processing	The systematic application of biology for an end use in military engineering or medicine

develop and maintain an indigenous capability to tailor foreign sourced technology to our own environment. The ADF, therefore, needs to have a strategy identifying the key technologies that need to be monitored and those for which indigenous expertise should be maintained. This is particularly important for the RAAF because it is dependent on imported technology. In the past the linkage between ADF force development and research and development activity within the Defence Science and Technology Organisation (DSTO) was not strong. There is need to ensure that there is a close, direct link between the two so that DSTO can support ADF air power in the future.³⁷

Force Structure Determination

In selecting the technologies in which to develop excellence from lists, such as that contained in Figure 2, Australia's Defence Science and Technology Organisation needs ADF guidance on its force structure

³⁷ The Parliament of the Commonwealth of Australia, Joint Committee of Public Accounts, Report 318, *Public Sector Research and Development*, June 1992, Vol 1, p 226.

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determinants. The latter are the attributes which the ADF believes should characterise its force. These attributes must be consistent with the ADF mission which is to promote the security of Australia and to protect its people and interests. The nature and levels of ADF capabilities required to carry out this mission are based on the need 'to maintain a defence force which can defeat those capabilities which could credibly be brought to bear against us in our sea and air approaches and on our territory'.³⁶ In denying Australia's approaches to an adversary, the ADF may be called upon to take the operational initiative both within and beyond the area in which Australia has interests important to defence.³⁹ The required nature and level of ADF air power capabilities may be determined by examining the characteristics of air power which contribute to the achievement of the ADF mission.

Flexibility. The attribute of flexibility implies that air assets 'can be diverted quickly and effectively from one task to another and from one target to another'.⁴⁰ Given that Australia's financial resources are such that the fleet size of operational air assets is not large, the inherent flexibility of the fleet is important. Hence, multi-role, multi-mission air assets are preferable to single role/mission platforms. The ability of air assets to operate during day and night and in all weather conditions within the Australian environment is an important contributor to the degree of flexibility available. The day/night, all weather capability requirement applies equally to air weapons and the infrastructure supporting air operations. Such infrastructure would include surveillance, reconnaissance and C⁴I facilities. This infrastructure needs to have high reliability and survivability in order to support effective air operations. Moreover the availability rate of air assets also needs to be high.

Responsiveness. Implicit in the concept of responsiveness is the ability of 'going anywhere and covering long distances' with little delay.⁴¹ Given Australia's geography, this attribute is particularly important. Responsiveness is dependent upon the inherent reliability and maintainability of air assets; that is to say, the degree to which they do not depend on the forward deployment of substantial maintenance and

³⁸ Defending Australia: Defence White Paper 1994, Op cit, p 23, para 4.7.

³⁹ *Ibid*, p 14, para 3.7.

⁴⁰ DI(AF) AAP 1000, *Op cit*, p 37.

⁴¹ *Ibid*, p 38.

logistics facilities. Major deployments always involve much effort and use up valuable resources such as air transport. Moreover, maintenance and logistics facilities are vital centres of gravity which the enemy may elect to attack and, therefore, need to be protected. This causes a further drain on ADF resources. Hence, air assets should be highly reliable and maintainable, and capable of operating from remote airfields without substantial facilities and personnel support. Underpinning this capability would be the availability of secure, reliable communications.

Responsiveness is also dependent on the ability to support aircraft. The degree to which particular air power assets are readily supportable will determine the operating costs and their endurance during operations. Aspects of supportability include the ease of access to technical spares and support equipment throughout the life of the asset. For instance procuring assets which are not assured of being supported by the supplier over the life of type, has the potential to make the asset obsolescent soon after acquisition. Alternatively, it has the potential to greatly increase the operating cost, if special arrangements need to be made for support of the asset several years after acquisition. The reliability and timeliness of supply of these items during contingencies is a vital measure of supportability. The capability of defence personnel or indigenous contractors to provide the necessary technical support is also an important contributor to responsiveness.

The ability of the command structure to respond to the evolving operational environment is also an important contributor to the responsiveness of air power. In part, the responsiveness of the command chain depends on the quality of communications and the facilities supporting the decision making process. The ability of the leadership to make command decisions and to communicate them to the operational elements is a vital centre of gravity that is frequently a primary target. Hence, these facilities not only need to support the capacity to make timely decisions but they also need to have a high probability of survival if attacked.

Shock. The ability of air power to quickly come 'out of nowhere' delivering concentrated firepower generates a shock effect upon the enemy which may disorient and degrade his decision process. Several capabilities need to combine to create this shock effect. First, it implies that air power arrives at the vital place, at the critical time, without being detected. The ability to determine the correct time and place for the concentration of air power relies on timely, accurate intelligence and correct analysis. The ability for air assets to arrive without detection can be aided by the employment of low observable technology, the use of deception measures

to defeat the enemy's detection system, effective electronic warfare techniques or alternatively, a combination of these capabilities. An appropriate selection of capabilities will depend on the range available within the existing funding limitations, and the nature and degree of threat.

Minimisation of Casualties. High casualty levels either of own forces or civilians are becoming politically less acceptable to Western societies. Hence, the use of precision weapons would be expected to increase. As was seen above, an alternative or complementary capability to precision weapons is non-lethal weapons. However, the minimisation of casualties is also dependent on the availability of precise intelligence as to appropriate aiming points and also on the level of risk to non-combatants. The need for precision in targeting information has increased as the accuracy and lethality of weapons have improved. As one air commander has pointed out, 'in the past you wanted to know where the tanks were stored. Now you want to know where the load-bearing wall is in the building where the tanks are stored'.⁴² The breakdown of intelligence was evident During the Gulf War in the American attack against an Iraqi 'command bunker' which was also being used as a public shelter.

Survivability. The survivability of air assets is of particular interest to the ADF because of its limited air fleet size. The good survivability of the F/A-18 aircraft has been demonstrated in several accidents which have occurred during operational training. In peacetime, survivability is an important attribute because it involves less cost in procuring replacement assets lost in accidents. However, in war high survivability is reflected in low attrition levels which extend the sustainability of operations.

Range, Endurance and Payload. There is always a trade-off between the air power parameters of range, endurance and payload. The vast area of Australia and its territories make this a difficult balance to strike. However, the range, endurance and payload may be extended in two different ways; though the use of air-to-air refuelling and through the use of forward airfields for refuelling and weapons loading purposes. For this latter action to be effective, air assets would need to be able to accomplish refuelling/weapons loading and relaunch without substantial ground support. Otherwise the maintenance and protection of these forward airfields becomes a drain on funding and combat resources. Air assets would also need to have excellent reliability and maintainability.

⁴² Horner, C.A., 'New Era Warfare', in Stephens, A. (Ed), The War in the Air 1914-1994, Op Cit, p 322.

Interoperability and Complementarity. The ADF places great emphasis on joint operations. For such operations to be effective there is a need to have interoperability between the services in communications and combat support systems. Such interoperability is important also in combined operations with allies. The existence of joint doctrine for the operational level of war is another vital determinant of the interoperability between the services.

For effective joint operations there needs to be a determination of the roles and missions that each service is required to perform. This is important because it provides a sound basis for force structure development while ensuring an appropriate level of redundancy without excessive duplication.

Cost of Ownership. Air power capabilities are generally expensive to acquire and operate. The cost of ownership of these capabilities can vary over the life of the assets. To date the life cycle cost of ownership has not been well understood at the capability evaluation phase before actual acquisition. While a low acquisition cost is important, the operating costs have the potential to significantly drain ADF resources over several decades while the assets remain in service.

Conclusion

There are many factors which will shape the future of Australian air power. In a geostrategic sense, Australia is fortunate not to be a party to any dispute which is likely to lead to military conflict. However, there are several points of tension within the Asia-Pacific region which generate a measure of uncertainty. Therefore, while not acknowledging any threat, Australian defence policy is to carry out future planning on the basis of military capabilities which might credibly confront Australia in the future. The defence of Australia is a substantial task; it requires the ADF to be prepared to deny our approaches across an area corresponding to 10 per cent of the earth's surface. The speed, reach and responsiveness of air power enable it to make a substantial contribution to Australia's defence. The form that this contribution can take may include cooperation in regional security or the conduct of operations directly in defence of Australia.

The capacity of Australian air power to perform any of these roles will be influenced by developments in the political, economic and social spheres. Over the next 25 years, key ADF air assets will reach the end of their operational life. These include the F/A-18, F-111, C-130 and Macchi aircraft. There are also plans to fill an existing capability gap by acquiring an airborne early warning and control capability. The need to acquire these new and replacement capabilities arises at a time when only a small increase is expected in defence expenditure, if any at all. Following the end of the Cold War the Australian public is demanding that social security programs and jobs creation initiatives take a higher priority in government outlays than defence. Any savings which the ADF has been able to generate through reductions in personnel numbers and through commercialisation of various support activities will in all likelihood be subsumed by procurement programs and other increased costs. Therefore, there is a strong likelihood that limitations in future defence budgets will be reflected in smaller fleet sizes.

Given the likelihood of constrained fleet sizes there is a need to exploit the force-multiplication effect generated by technology. The versatility, flexibility and responsiveness inherent in technologically advanced air assets, weapons and operations support systems will enhance the ability of air power to meet the challenge of the future. In determining the future structure of the force, there are a number of issues that need to be considered. Arguably, the most important of these is that ADF air power assets, support systems and facilities will need to be survivable. This is because the force structure will be based on relatively limited numbers of high-value assets. An associated characteristic is system reliability. Highly reliable systems which are easily supported and maintained are important force-multipliers. Naturally, these assets will need to be tailored to operate effectively within Australia's operating Important aspects of this environment are the environment. geographically remote areas from which air operations will need to be conducted. Hence, there is a need to enhance the deployability and mobility of air power assets and facilities. Particularly important in this are assets capable of operating in forward areas for extended periods with a low reliance on major base support.

Effective surveillance and C⁴I capabilities are of vital importance to Australia's defence. With such a vast area to defend, the preferred course is to quickly detect emerging threats and to deal with them before Australian territory is endangered. Not only is there a need to be able to easily detect such threats, but also to be able to verify and respond to them in a timely manner. The C⁴I system needs to be speedy, responsive, reliable, survivable and interoperable with those of the other services and allies.
Australian Air Power - the Shape of Things to Come

An important aspect of our ability to create and support future air power capabilities is the quality of personnel that will have charge of operating and maintaining these capabilities. Quality people can potentially make up for the deficiencies or shortcomings of the systems they operate. Hence an important aspect of future planning will be personnel management. This will include personnel policies with respect to recruiting, education, training, and career management. Because policies that are put in place take several years to take effect, it is necessary to take a pro-active approach to personnel management. Of course, the ultimate goal is for the requirements of the service to be satisfied, however, senior management cannot lose sight of the expectations and needs of the personnel it administers. As community values change so will those expectations with respect to conditions of service and remuneration.

In determining future force structure, one must also be prepared to examine radically different solutions to current operational problems. Technologies such as unmanned aerial vehicles and non-lethal weapons are two such directions that need to be investigated. The doctrinal implications and Law of Armed Conflict issues need to be considered as well as the operational benefits of such capabilities. Australia needs to maintain an awareness of such developments and be prepared to consider them in its force structure determination.

The foregoing discussion has attempted to show that there are many, varied factors which influence the future shape of national air power capabilities and functions. It is important that a balanced consideration of all these factors is made for the purposes of long-term planning, not simply concentrating on the corporate and resource planning aspects. The operational commander provides an essential contribution to this planning process by advising on the impact that proposals being considered will have on preparedness. The second vital task that the operational commander performs is to assist in the doctrine formulation process that must underpin the sound employment of air power resources, and the creation of an effective command and control structure.

CHAPTER EIGHT

ADF ORGANISATION FOR JOINT OPERATIONS

As discussed, for many years after Federation there was a common view that Australia could not defend itself without help from powerful allies. This belief led Australia to link its fate to that of Britain and more recently the United States by adopting a forward defence policy. This policy had significant implications for force structure development and operational procedures. A basic presumption in structuring the Australian Defence Force and in establishing operating procedures was the need for interoperability with British and American forces. This was because during operations the Australian force elements would be subsumed within the larger forces of our allies. Consequently, it was necessary for each Australian service to have equipment and operating procedures which were compatible with those of the corresponding allied While there was nothing inherently wrong with that sister services. practice, there was not a concurrent effort to ensure interoperability within the Australian Defence Force. As a result there was little emphasis on joint operations and on the development of joint doctrine.

By the late 1960s the end of Australia's forward defence era was imminent. Britain had stated its intention to withdraw its forces from east of the Suez. Moreover, the United States had stated in clear terms that it would not intervene directly in the defence of its allies unless they were under threat from a superpower. These developments led Australia onto a path of defence self-reliance. This change in defence posture had direct implications for the Australian Defence Force (ADF) and the way it would conduct itself in battle. There was now a clear need for the ADF to develop joint doctrine which would enable it to fight as an integrated force.

In the past two decades, great strides have been taken toward improving the joint capability of the ADF. A series of organisational reviews was followed in 1987 by the Australian Government's formal adoption of a policy of defence self-reliance. As well, the ADF had already been promoting the concept of joint operations. A command structure to support such operations was established and is currently in the process of refinement. The current higher command structure is illustrated in Figure 1.¹



The Higher Command Organisation of the ADF

Under the existing higher command arrangements, the Prime Minister and Cabinet, including the Minister for Defence, form the War Cabinet comprising the grand strategic level of war. The Chief of the Defence Force (CDF), supported by the Vice Chief of the Defence Force and the Chiefs of Staff Committee, function at the military strategic level. The CDF provides advice to the government and is responsible for implementing government directives, but normally would not become

ADFP 1, Op Cit, Annex A

involved in the day-to-day conduct of operations. The role of the Vice Chief and the Chiefs of Staff Committee is an advisory one. The Service Chiefs of Staff form the core of the Chiefs of Staff Committee chaired by the CDF but are not in the command chain for operations. The Service Chiefs' role is to advise the CDF on the conduct of operations and on the preparedness of their respective services.² The Chiefs of Staff are also responsible to the CDF for the efficient and effective functioning of their service, for 'raising, training and equipping forces for employment on operations, and for providing administrative and logistic support to those forces'.³

Joint doctrine provides that in times of more substantial conflict a Commander Joint Forces Australia (CJFA) may be appointed to 'command and coordinate operations'.⁴ More substantial conflict is defined as medium or high-level, sustained military operations involving the use of the entire ADF possibly supported by alliance partners.⁵ Under the current arrangements, the Vice Chief of the Defence Force may be appointed CJFA.⁶ Alternatively, as is presently the case, the CDF may elect to appoint another officer. Lieutenant General Sanderson, the present CJFA (designate), is not currently in the command chain for operations, having responsibility only for developing doctrine and further refining the organisational structure for operational level command functions. General Sanderson was expected to act in the capacity of CJFA during Exercise KANGAROO'95.

Operational command passes from the CDF (or the CJFA if one is appointed) to the Maritime, Land and Air Commanders. The latter are permanently appointed Joint Commanders, having permanently assigned forces under their command. The three Joint Commanders have dual responsibilities. They are responsible to the CDF for the planning and conduct of operations and also to their respective Service Chiefs of Staff for the training and administration of their command.⁷ In more

- ⁴ *Ibid*, Chapter 4, sub-para 423b, p 4-4.
- ⁵ *Ibid*, Chapter 3, sub-para 332c, p 3-6.
- ⁶ *Ibid*, Chapter 4, para 426, p 4-5.
- ⁷ *Ibid*, Chapter 4, sub-para 423c, p 4-4.

Preparedness denotes the ability of forces to undertake operations in a timely manner and sustain the activity involved in those operations. (Australian Defence Force Publication 4 (ADFP 4), *Mobilisation Planning*, 1993, Glossary, p xvi.

³ ADFP 1, *Op Cit*, Chapter 4, sub-para 423a, p 4-4.

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substantial conflicts the Joint Commanders would come under the command of a CJFA. In less substantial conflicts, when a CJFA is not appointed, current doctrine allows for one of the Joint Commanders to be put in command of operations under the designation of Joint Force Commander.⁸ When the Joint Commanders are either unavailable or inappropriate for the task, additional Joint Force Commanders may be appointed.⁹ There are varying opinions regarding the merits of placing one or another Joint Commander in command of operations in lieu of appointing a Joint Force Commander. This debate has yet to be resolved.

Joint Force Commanders are appointed by the CDF either on a permanent basis or for a specific task. Naturally, the selection of the Joint Force Commander(s) will depend on the nature of the contingency and the operating environment. At present, the only permanently appointed Joint Force Commander is Commander, Northern Command (COMNORCOM). When necessary for a specific task, the CDF will assign to the Joint Force Commander(s) appropriate forces, specify the degree of operational authority that they may exercise over the assigned forces, and detail the support to be provided to them by the three services. Forces not assigned in this manner remain under the command of the Joint Commanders.

The Operational Level of War

At the operational level of war, a component command structure has been adopted; the three services thus constitute Components headed by the Joint Commanders. Joint doctrine stipulates that CJFA, the Joint Commanders and the Joint Force Commanders all function at the operational level.¹⁰ In the absence of a CJFA, the Joint Commanders and Joint Force Commanders report directly to the CDF. If a CJFA is appointed, command for operations passes from the CDF though CJFA to the three Joint Commanders and to any Joint Force Commanders that have been appointed. CJFA would be responsible for the command and coordination of operations. As noted earlier, the Joint Commanders would retain command of all forces not assigned to the Joint Force Commanders. The latter would have varying degrees of command and control over assigned assets in accordance with the CDF's directive.

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Ibid, Chapter 4, Annex A.

⁸ *Ibid*, Chapter 6, para 604, p 6-1.

⁹ Loc Cit.

(See Figure 2). Thus, current doctrine allows the CDF a measure of flexibility in establishing command arrangements to suit the nature of the contingency. The CDF may choose to appoint a Joint Force Commander to exercise command in less substantial conflict, a lead Joint Commander if it is primarily a single environment activity but one requiring support from at least one of the other two Joint Commanders, or in a more substantial conflict to appoint a CJFA.



To give greater focus to the operational level of war, moves are in progress to collocate the three Joint Commanders into a single Joint Headquarters. The collocated headquarters is planned to be operational by 2000, although interim arrangements are scheduled to be in place by mid-1995. The philosophy underlying the establishment of the collocated Joint Headquarters is to facilitate centralised command while allowing for decentralised execution of operations. The aim is to provide a mechanism for formulating a single, coherent campaign strategy to overlay the operations prosecuted by the three Components. The exact organisational structure of the collocated Joint Headquarters has yet to be determined. Nevertheless, the intention appears to be to form joint intelligence, operations and plans areas within this Headquarters with the objective of providing to the operational level commanders a single intelligence picture of enemy capabilities and disposition and a similar view of own force capabilities which will form the basis for campaign strategy development. Australian Defence Force Organisation for Joint Operations

An important objective of the interim headquarters will be to develop appropriate functional relationships between the collocated Component staff. Whether a component or an integrated structure will be adopted remains to be seen.

Despite the current non-permanent nature of the CJFA appointment, the move to collocate the Joint Commanders into a single Joint Headquarters and to create a joint staff, would appear to be formalising a tier of command between the CDF and the three Joint Commands. The function of this tier of command would be to direct and coordinate ADF operations, a function now normally associated with CJFA, during times of more substantial conflict.

The establishment of a permanent operational level collocated Joint Headquarters with permanent staff but without a permanent commander appears to be an odd arrangement. The role of such a headquarters should not be viewed only in the context of the conduct of hostilities but also in terms of preparing for conflict. Such preparation encompasses doctrine formulation, force development and training. All of these are peacetime activities. The question that needs to be addressed is how focussed does the development of the ADF need to be at the operational level. Does the need for such a focus arise only in times of actual conflict of a more intense nature, or is it a pervasive need? If the former is the case, then there needs to be careful consideration of the commitment of resources toward creating a new operational level headquarters against a need which, on current strategic guidance, is a relatively remote possibility. However, if there is a more pervasive need for a focus at the operational level, then the half-measure approach of creating the Joint Headquarters without a permanent commander needs to be carefully examined.

At the present time the three Joint Commanders develop their operational forces to meet the CDF Preparedness Directive (CPD). Therefore, the nature and level of tactical capabilities of the ADF are directed by the military strategic level. There is no operational level coordinator of a joint preparedness capability. Currently, Headquarters ADF through the Assistant Chief for Operations and Assistant Chief for Development seeks to produce the requisite level of coordination in capability and preparedness generation. The fact that a permanent CJFA has not been appointed would seem to argue that the present arrangements are working satisfactorily. Yet it is fair to question whether the translation of strategic requirements into tactical capabilities is most appropriately carried out by a strategic level headquarters. One could argue that the military strategic level should concentrate on the generation of overarching capabilities. This is a more involved process than simply leaving each individual Component to decide how it will support the overarching capabilities. Doing so does not adequately address the need for interaction between the three Components. Individual Components tend to bias the development of their tactical capabilities along the lines that each considers to be important. At the present time there is inadequate provision for adjusting individual Component priorities so that they are mutually supportive from an operational level perspective. The establishment of the Joint Headquarters would appear to create an opportunity for a closer interaction between the three Components. Without a presiding commander it is difficult to see how the process of interaction would work in a non-adversarial way. So long as resources are not strained there is little occasion for tension between the three Components. However, in the present economic environment, resources are bound to be strained: difficult decisions have to be made and clear direction is needed when consensus becomes unlikely. A commander whose focus is on preparing for and conducting joint campaigns at the operational level, and (to a degree) removed from service biases, would be better placed to make these types of decisions.

According to some, an unusual aspect of the collocated Joint Headquarters is that it is planned to be a fixed facility (as opposed to a deployable one), located in the south-east of Australia, well away from the expected area of operations. While in past conflicts operational level commanders have deployed forward to the theatre of war, there does not appear to be a compelling need for the ADF to develop a deployable operational level headquarters, particularly one deployable to off-shore locations. For there to be a need to deploy such a headquarters off shore. it would mean that a substantial part of the operational capability of the ADF would have been committed to an off-shore theatre. There is nothing in current strategic guidance that indicates a government desire for such a contingency to be addressed. Moreover, there is no immediate need to be capable of deploying the collocated Joint Headquarters to forward areas within Australia. In modern warfare commanders increasingly rely on others and on technology to extend their influence. Hence, the physical distance between the operational commander and the forces under command becomes increasingly irrelevant. Modern communications facilities are such as to make even distances of several thousand kilometres of little consequence. Accordingly, the collocated Joint Headquarters operating in a purpose-made facility would function more efficiently than when using ad hoc communications at a deployed site.

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The Staff Problem

The problem of finding adequate numbers of qualified staff to man the collocated Joint Headquarters should not be underestimated. Finding qualified staff to man headquarters is a problem repeatedly experienced even during exercises conducted under more benign conditions than prevail during contingencies. For example, in order to mount 24-hour operations, Air Headquarters has occasionally resorted to obtaining relief manning from other areas of the Air Force. One option is to transfer staff to the collocated Joint Headquarters from the Component Command Headquarters. However, this is would be done at a cost. When not engaged in operations, staff within Component Headquarters are fully occupied on operating the running system. The practice during exercises is for these staff to divide their time between exercise activities and their normal duties. Consequently, the permanent transfer of staff to the collocated Joint Headquarters could not be easily accommodated. One common paper solution to the problem is to adopt the practice of augmenting a standing headquarters which in peacetime is manned by skeleton staff. At a time of constrained manpower resources the usual means of achieving the augmentation is to assign dual responsibilities to staff or. alternatively, to shadow-post selected the designated augmentation staff to headquarters positions they would occupy during operations.

While this would appear, at first glance, to be a practical solution to the problem of an inadequate number of qualified staff, there are hidden costs which need to be acknowledged. It is physically impossible for augmentation staff to be functioning in two capacities at the one time and reporting to two superiors at two separate locations. when performing duties within the Joint Headquarters, Hence, augmentation staff would not be doing their regular jobs, and vice versa. Work that necessarily remains undone in this way in itself may have an adverse effect on the conduct of operations. At a time when the ADF is shrinking, any spare manpower capacity has been eroded. Therefore. there is an increasing likelihood that redeploying staff to operational headquarters will stress the running system. Even though this may not be of particular concern over the short term, in a drawn-out conflict such stress will adversely affect operations.

Another possible solution to the staff problem is, in a contingency, to use officers attending courses such as the RAAF Command and Staff Course and the Joint Services Staff Course. While this course of action may be feasible, it does not necessarily provide an optimum solution because it is assumes that staff available in this way

are competent to act in roles in which they may not have any experience or training.

COMNORCOM

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Interestingly, COMNORCOM is the only Joint Force Commander whose responsibility has been defined in terms of a specific geographic area. The rationale behind doing so is not immediately clear and appears to fly in the face of current doctrine. One of the key force characteristics specified by doctrine as necessary for the ADF is *versatility*. Importantly, versatility requires that:

'Command and control systems, ... *organisation*, doctrine and procedures should all be sufficiently versatile to allow for their effective employment in a wide range of operational roles and geographic areas.'¹¹

Moreover, doctrine further stresses that:

'The size and structure of a joint headquarters are dependent on the nature, level and scale of the joint operation envisaged. There is considerable *flexibility* when raising the force to *tailor* the joint headquarters *to suit the operational need* and force compositions.'¹²

Clearly, the fundamental philosophy underpinning current doctrine is to create Joint Force Commands and to define their responsibilities to match the operational need at the time of their creation. Given this underlying philosophy, the creation of a Joint Force Command with a predefined geographical area of responsibility, as in the case of Northern Command (NORCOM), does not appear to have a clear doctrinal basis.¹³ That is not intended to down-play the very positive impacts the existence of NORCOM has had on civil-military relations in the North of Australia, and on the Australia-Indonesia military relationship. The

¹¹ *Ibid*, Chapter 3, para 355, p 3-10. (Emphasis added.)

¹² *Ibid*, Chapter 8, para 803, p 8-1. (Emphasis added.)

Group Captain A. Blyth properly pointed out that one could argue that NORCOM's role in building-up the civil-military relationship and in assisting civilian authorities dealing with illegal foreign fishing, immigration and trade, plus the requirements for surveillance of the northern approaches to Australia all add up to a significant operational need. Even so, the problem of integrating COMNORCOM into the operational level command structure remains.

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existence of NORCOM has also provided an opportunity for the development of joint operations doctrine.

Despite these benefits, the existence of NORCOM creates a command challenge of significant proportions. Specifically, it is not clear how NORCOM can be integrated into theatre operations whenever a Joint Commander or the CJFA is also functioning at the operational level of war. There would be no problem if the NORCOM area of responsibility (AOR) comprised an appropriate sub-division within the area of operations given the nature of the contingency. Where this is not the case, the existence of NORCOM becomes an impediment to effective operations. Perhaps of greater concern is the potential subdivision of forces between two operational level commanders; COMNORCOM and a lead Joint Commander or a CJFA.

The status of COMNORCOM as an operational level commander makes sense in the absence of CJFA where the former reports directly to CDF. However, whenever a CJFA is appointed it makes operational sense for COMNORCOM to function at the tactical level, subordinate to CJFA. It could be argued that since the Joint Commanders do not operate at the tactical level there is no reason for COMNORCOM to do so. It is true that the Joint Commanders operate at the operational level. However, their role is to advise and support the operational commander (CJFA) in the development and execution of the campaign plan. The existence of a second operational commander such as COMNORCOM could potentially lead to unclear lines of responsibility. Exactly how the situation will evolve remains to be seen. KANGAROO '95, for which a CJFA has been designated, will afford an opportunity to test the extant command arrangements.

'Joint' Component Commanders but not Joint Staff

Although the designations Maritime, Land and Air Commander, Australia, would appear to indicate that a joint functional component command structure has been adopted, this is not the case. The Joint Commanders are supported essentially by single-service staff although there are embedded in their organisation members of the other services. The latter staff do not perform a liaison function but are on the staff of the headquarters to which they are assigned. They do not constitute a large presence numbering up to six positions not all of which are continually manned. For example, some of the Air Force positions in Maritime Headquarters are reserve appointments. Neither do these 'joint

staff constitute high level representation; the highest rank of such staff is set at Lieutenant Colonel and in some staffs Major (equivalent). Unlike the American system whereby separate liaison cells are assigned to component headquarters from the other components, the ADF does not have distinct liaison teams (as opposed to the joint staff) within the Joint Commands. Consequently, the liaison function is performed informally.¹⁴ In the present situation, where the Joint Commanders and their staff are not collocated, the need for liaison in joint operations is high. However, in the Joint Headquarters where the Joint Commanders will be collocated, liaison will be facilitated. Even so, there should be a designated point of contact for liaison purposes in each of the Component Headquarters.

It is fair to question whether a joint staff is necessary for the successful operation of a functional component headquarters. There are, of course, valid arguments on both sides of the question. First, the use of joint staff at least gives the impression that the interests of all services are catered for in campaign planning. This is particularly important in air campaign planning. Surface forces have had a traditional mistrust of air plans prepared by air force staff, believing that the latter do not give adequate weight to tactical air operations in support of the surface battle.

On the other side of the coin, it could be argued that jointness does not automatically improve the combat effectiveness of the force. Indeed, often the prime motive behind the adoption of joint structures is not enhanced combat effectiveness but rather the pursuit of economy and organisational efficiency, through the elimination of duplication. While the elimination of corporate waste is a valid goal, in terms of combat effectiveness, the best use of available staff may not necessarily be in the form of a joint organisation. One can also argue that the use of liaison officers who are not under the command of the Joint Commander in whose headquarters they serve, means that they are freer to argue the cause of their own service as part of their advocacy role. All these arguments were aired during discussions of the non-joint nature of the JFACC's planning staff during the Gulf War. There was not compelling argument either one way or another.

However, of more importance than a joint staff is the development of a common war fighting doctrine. If all services have a

¹⁴ This should not be interpreted to mean that there are few contacts or exchanges between the environmental headquarters. Staff from these headquarters often work cooperatively in joint working parties and committees and liaise frequently as part of their routine work.

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common starting point then there is a less urgent need for joint staff because the mechanism for ensuring a fair representation of individual service concerns is already present in the form of doctrine. With common doctrine for the conduct of war at the operational level, the provision of liaison officers within component commands should constitute an adequate advocacy mechanism for each service. American services in the Gulf War did not have a common doctrine although, since the mid-1980s, they had moved some of the way toward achieving that end. In the Gulf War the command relationships had been clearly established and operational level command had been centralised at the appropriate level.

Need to Test ADF Doctrine

As noted earlier, ADF joint doctrine at the operational level of war is untested either in operations or through exercises. This doctrine has evolved in part from a study of past conflicts in some of which Australian forces participated, although with little, if any, command experience at the operational level. Moreover, ADF joint doctrine in part has been derived from foreign military doctrine, chiefly that of the United States. Yet rarely has the scale of conflict, the size and capability of the opposing forces, the political conditions, or physical characteristics of the area of operations of past conflicts experienced by foreign and Australian forces corresponded to the nature of warfare postulated in Australian military guidance. Hence, there is reason to question the portability of foreign doctrine to the ADF and the applicability to us of lessons learnt in past conflicts so different in nature from those expected to be waged by the ADF.

A major difference between American joint operations in the Gulf War and the conditions under which the ADF would fight is an overabundance of combat resources, not least air power resources. This allowed some of the fundamental doctrinal disputes between American services to be side-stepped. In the ADF's case it is scarcity of resources, especially air resources, rather than abundance that will be an overriding factor. In that situation, the solutions that worked for the American military in the Gulf may not be appropriate to the ADF.

Hence, while both foreign lessons and doctrine may be valid, they still need to be validated in the Australian context by the Australian Defence Force. This validation process should include testing during ADF exercises. Validation of this nature, particularly as it applies to doctrine for the operational level of war, is not done to a great extent by the ADF.

Without adequate validation there is little benefit in continuing the process of developing joint doctrine. Following the unparalleled success of the Gulf War there is a temptation to draw enduring lessons from what in reality was a unique conflict. A rare congruence of conditions set up a favourable outcome for the coalition. In particular, there was the unusual situation of few political restraints on the application of military force, there was a total absence of credible resistance by the Iraqis, and an overwhelming imbalance in the technological capabilities of the two sides. These are not necessarily the conditions under which the ADF will be waging war. The ADF needs to examine national strategic guidance, determine the conditions under which it is likely to operate and exercise accordingly.

CHAPTER NINE

CURRENT PRACTICE IN ADF AIR CAMPAIGN PLANNING

At the time of writing, Australian Defence Force (ADF) doctrine on the conduct and planning of air campaigns exists in various forms and in a range of documents. These include the RAAF Air Power Manual and manuals in the Australian Defence Force Publication (ADFP) series. There are also standard operating procedures covering the operations of Air Headquarters and RAAF operational units. However, development of this doctrine has progressed under two handicaps. First, while each source fills an important need, there has been no attempt to compile the doctrine into a single, comprehensive manual dealing with the planning and conduct of ADF air operations in joint and combined campaigns. The effect of having numerous doctrine sources which are produced by different parts of the ADF is that doctrine produced in this manner has the potential to lack both cohesion and completeness. Indeed, depending on the frequency with which each publication is revised, it is possible to have significant discrepancies between the various sources of such doctrine.

The second handicap affecting the development of ADF air campaign doctrine is that this doctrine is rarely fully validated. The reason for this is readily understood. Tasks of higher priority and more immediate need have a propensity to displace the no less important but less urgent task of doctrine validation. Moreover, the current emphasis on the operational level of war and doctrine formulation for this level is relatively new within the ADF. Until recently, ADF attention has been focussed on the strategic and tactical levels of warfare. Moreover, resource constraints do not permit frequent large-scale exercises with the scope to test joint doctrine. Consequently, air campaign doctrine formulation in the ADF is carried out predominantly through desk-top study in a state of uncertainty.

The lack of doctrine validation by the ADF has a significant negative impact. In the absence of validated doctrine, staff organisation, functional relationships, and staff procedures evolve without a proven basis. In that circumstance there is no way of assessing the impact of organisational change on the combat effectiveness of the force. Without such a cross-check there can be no assurance that combat effectiveness will be optimised, or indeed enhanced, through organisational change. Recently, the ADF has experienced a lengthy period of organisational change while pursuing improved efficiency and economy. In an environment of almost constant change there is an increased risk that force effectiveness will be degraded. In fact a driving force underlying the increased emphasis on joint operations in the ADF has been the desire to improve efficiency by removing duplication between the three services. While there is nothing fundamentally wrong with organisational change in the interest of improved efficiency, care needs to be taken to ensure that force combat effectiveness does not suffer.

In recent times the need to train and exercise at the operational level of war has been recognised by the ADF. One of the objectives of RAAF Exercise, PITCHBLACK'94, was to exercise the Air Headquarters command and control system in planning and directing offensive air operations. PITCHBLACK'94 experience was invaluable for the further development of doctrine and staff procedures. When the postexercise review identified a need to revise current standard operating procedures, Air Command instituted an immediate review of these procedures. Indeed, a revised draft was in circulation for comment by October 1994, just three months after completion of the exercise. Air Command's quick action to revise its procedures based on the lessons learnt from PITCHBLACK'94 is creditable. The momentum thus generated needs to be maintained. Firm milestones should be set for the review and publication of the revised procedures and plans should be made for revalidation. However, the staff procedures under development by Air Headquarters do not fill the need for a comprehensive doctrine of air operations planning which sits within the broader context of ADF joint operations doctrine. The Air Headquarters staff procedures relate specifically to the Air Command organisation and its operations.

Although PITCHBLACK'94 was primarily an air defence exercise, it was an excellent vehicle for a first attempt at exercising the planning and conduct of air warfare at the operational level. It allowed Air Command to test the existing command arrangements and the division of responsibilities between the operational and tactical levels of war. It also afforded an opportunity to test the functional relationships between Air Headquarters staff. Of necessity, strategic level directives and guidance were simulated for the purpose of the exercise, as was the participation of ground forces.

Exercise PITCHBLACK'94

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In the exercise scenario the mythical nation, Orangeland, was seeking to extract concessions from, the equally mythical, Blueland. Blueland infrastructure, which needed to be defended from air attack, included Air Base Tindal and adjacent areas. It also included road, rail and telecommunications links to the south. The Orangeland offensive campaign comprised three phases. The first phase consisted of air strikes against Blue targets. That was followed by an air interdiction phase that prepared the battlefield for the third phase, a (simulated) ground offensive.¹

Orange Air Forces comprised RAAF F-111C aircraft, and aircraft from the Republic of Singapore Air Force (RSAF) and the United States Marine Corps. Blue air defence forces consisted of RAAF F/A-18 aircraft and ground based air defences provided by the Australian Army and the RSAF. The participation by multi-national, multi-service forces allowed combined air operations to be conducted during PITCHBLACK'94. Moreover, because of the variety of aircraft available, Orange Air Forces were able to conduct *conjoint* air operations by creating force packages of several aircraft types.²

The primary aim of PITCHBLACK'94 was to exercise an integrated air defence system and to provide tactical training to participating aircrew in both Orange and Blue Air Forces. The objective of exercising the Air Headquarters command and control system in planning and directing offensive air operations was added during the latter stages of exercise planning. Because the primary objective of Exercise PITCHBLACK'94 was to provide tactical training, there were a number of

Conjoint air operations are those involving various types of aircraft working cooperatively together. Examples of conjoint operations abounded in the Gulf War. One such example comprised the coordinated attacks by F-15E Eagle fighters and GR-1 Tornado fighter-bombers against the Iraqi radar installations creating gaps in the Iraqi air defence umbrella through which non-stealthy aircraft could fly in safety in follow-on attacks.

Air Interdiction is the application of air power against enemy lines of communication, to cut and disrupt the flow of resupply and support assets. (DI(AF) AAP 1000, *Op Cit*, p 98.)

artificial restraints which impacted on planning at both the operational and tactical levels. For example, the ability to direct air operations and to task aircraft was constrained by the requirements of the various participating forces to fly pre-agreed daily schedules of given numbers and types of missions. Moreover, during PITCHBLACK'94 operational level command was exercised only for Orange Air Force operations. There was no Blue Air Component Commander per se and there was no operational level direction of Blue Air Force operations. The Commander Tactical Fighter Group, with the assistance of a small staff, merely monitored Blue Air Force operations from Air Headquarters. This was a significant limitation built into the exercise from the viewpoint of air campaign planning. The existing arrangements did not allow the opportunity to plan concurrent offensive and defensive air operations. Hence, the capacity to balance rival demands for the available air power was not exercised. PITCHBLACK'94 was also limited from an air campaign planning perspective because it did not test the interaction between the collocated Joint Headquarters and Air Command. Nonetheless, the exercise provided a unique opportunity to test current RAAF command and control arrangements, planning procedures and the division of responsibilities between the operational and tactical headquarters.

At Appendix 1, is a transcript of an interview with the then Air Commodore, now Air Vice Marshal, D.N. Rogers who acted as the Orange Force Air Component Commander for PITCHBLACK'94. This transcript gives some important insights into the command of air power at the operational level and the thinking behind air effort apportionment and targeting decisions.

Air Headquarters' Organisation

Under the existing ADF higher command arrangements, it is conceivable that where a Joint Force Commander is appointed and not a CJFA, ACAUST may not be in the command chain for operations at all. In that circumstance ACAUST would be responsible only for providing forces in support of the Joint Force Commander. However, whenever ACAUST is acting as a lead Joint Commander in his own right, or in support of CJFA, he would exercise operational level command over at least a portion of the RAAF operational elements.

RAAF operational units are organised along functional lines into five Force Element Groups; Maritime Patrol Group, Strike/ Reconnaissance Group, Tactical Fighter Group, Air Lift Group, and Operational Support Group. According to joint doctrine, ACAUST would normally retain control of Tactical Fighter and Strike/Reconnaissance Groups, and the strategic element of Air Lift Group.³ By implication, depending on the nature of the contingency, varying degrees of control of Maritime Patrol Group, Operational Support Group and the non-strategic elements of Air Lift Group may be assigned to other Joint Commanders/Joint Force Commanders. This is not unlike the situation in the Gulf War where the Joint Force Air Component Commander (JFACC) commanded or controlled only a portion (albeit a major one) of the available air forces. Airlift aircraft and Army rotary-wing assets were not controlled by the JFACC, while certain Marine and Naval air assets were placed under JFACC control only in specific circumstances.

The Air Headquarters organisation for operational level warfare has not been finalised. Moreover, the organisation currently specified in Air Headquarters' standard operating procedures does not necessarily reflect the organisation that will be in place after the establishment of the collocated Joint Headquarters. At the present time ACAUST is supported in performing his role of ADF air component commander by a two-tiered organisation. At the higher level of this organisation is the Battle Staff. At the time of writing, the organisation of the Battle Staff was as illustrated in Figure 1.⁴ Presided by ACAUST, the Battle Staff comprises the Air Headquarters Chief of Operations (COPS), the appropriate Force Element Group Commanders and the Battle Staff Executive Officer. Although they do not hold formal membership, Air Headquarters Branch Heads may be summoned to provide specialist advice to the Battle Staff as required.

Previously, when COPS was the only one star subordinate to ACAUST, the former was excluded from the Battle Staff and made responsible for the day to day functioning of Air Headquarters, while ACAUST was preoccupied with the command of operations. However, the recent establishment of the Chief of Support (CSPT), as a second one star subordinate to ACAUST, allows COPS to participate in the Battle Staff while CSPT takes care of day to day business. There has been some discussion on whether either or both COPS and CSPT should be members of the Battle Staff. Naturally, both would have some contribution to make. In his everyday role COPS heads the Air Headquarters operations staff,

³ ADFP 1, *Op Cit*, Chapter 5, Annex C, para 6.

Wing Commander Vilcins' help in providing some background information for this section is acknowledged. However, the author takes responsibility for the opinions expressed here and in later sections.

and accordingly officers appointed to the COPS position are required to have an operational background. It would not be unusual for such officers to have commanded one of the Force Element Groups before becoming COPS. Hence, by virtue of past experience and current responsibilities, COPS would be in a position to contribute to the Battle Staff operational deliberations.



Officers posted to CSPT would not necessarily have an operational background. However, on a daily basis CSPT is responsible for several support functions performed in Air Headquarters which impact Battle Staff deliberations. Such support functions include on maintenance, health and personnel administration. Therefore, CSPT would also be able to make some contribution to air campaign planning. However, if CSPT was heavily involved in Battle Staff activities, control of everyday Air Command functions could suffer. Hence, on balance, there is less compelling argument to support CSPT's membership of the Battle Staff than is the case for COPS. If CSPT is excluded from the Battle Staff, there is, of course, nothing to prevent him from being summoned in the role of specialist adviser if the need arises.

The membership of the Battle Staff is flexible. Depending on the nature of the operations, some or all Force Element Group Commanders may deploy to Air Headquarters to form the Battle Staff. Alternatively, taking advantage of available technology, tele-conferencing techniques may be used to 'convene' the Battle Staff even though the Group Commanders may remain at their own headquarters.

As things stand, the staff organisation supporting the Battle Staff is somewhat less well defined than is the Battle Staff itself. Loosely

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called the Battle Management Group, are Air Headquarters staff officers augmented by staff from the Force Element Group Headquarters who may deploy to Air Headquarters with their respective Group Commanders. Battle Management Group activities are currently coordinated by the Battle Staff Executive Officer, a Group Captain. Specialists from all Air Headquarters Branches which contribute to air operations planning are represented in the Battle Management Group. Staff accompanying Force Element Group Commanders to Air Headquarters also join the Battle Management Group acting in the capacity of role planning staff.



During PITCHBLACK'94, a sub-committee of the Battle Management Group was formed and made responsible for target selection. Called the Target Selection Board (TSB), it's function was to evaluate possible targets against the campaign objectives and limitations imposed by strategic guidance and Law of Armed Conflict with a view to proposing a priority list of targets for consideration by the Battle Staff. There was, of course, broad-based support provided to the TSB by several Air Headquarters branches, including advice from intelligence, operations and legal staffs.

The Air Campaign Planning Process



As depicted in Figure 3, air campaign plans produced by ACAUST have their origins in directives issued by national strategic and military the strategic levels of war in the form of strategic objectives.⁵ These objectives are directed to the operational level commander (CJFA) who develops the overarching campaign plan. This plan then forms the basis for the development of all subordinate plans one of which is the air campaign plan produced by ACAUST. The air campaign plan is thus designed to support the CJFA's

campaign plan contributing to the achievement of the overall strategic objectives.

The development of the air campaign plan would begin with the conduct of a military appreciation by the Battle Management Group operating under the directions of the Battle Staff. As part of the appreciation process, there would be a review of the situation and a development of the aim of the air campaign. This would involve understanding the strategic guidance provided by the Government, any additional guidance provided by the CDF and the requirements of the operational commander. The selected aim would be to support of the operational commander's aim and would be designed to achieve the mission assigned to ACAUST. All factors that could have a bearing on the conduct of the air campaign are then evaluated before an examination of courses open to the enemy and to own forces are examined. The outcome of these considerations is a preferred own course developed as an air campaign plan which is briefed to ACAUST and the Battle Staff. One aspect of the air campaign plan would be ACAUST's recommendation to the operational commander for the apportionment of air effort to the various phases and operations of the latter's campaign plan.

Once the air campaign plan and the apportionment recommendation has been approved by ACAUST, in the first instance, and

My thanks to Air Vice Marshal D.N. Rogers for providing copies of briefing slides used during PITCHBLACK'94. These appear as Figures 3, 4 and 5.

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secondly by the operational commander, the implementation phase may begin. There is considerable detailed planning activity associated with implementation of the air campaign plan. The detailed planning relates to daily tasking of air elements, monitoring their performance against specific objectives and adjusting subsequent tasks accordingly.

To do this, a rolling planning cycle was developed during PITCHBLACK'94 which was similar in some ways to the planning process adopted by the JFACC organisation in the Gulf War. However, a major difference was that unlike the Gulf War JFACC, Air Headquarters adopted the practice of issuing Air Tasking Directives (ATDs) to the tactical level air commander, in lieu of Air Tasking Orders. Air Tasking Orders based on the Air Tasking Directives were raised by the Orange Air Headquarters at the tactical level. The ATDs told the tactical level how air effort was to be apportioned, what targets were to be subjected to air strikes, the level of damage that was to be inflicted and the target priority order. The tactical level headquarters then raised the more specific Air Tasking Orders which detailed the force packages, weapons loads, times on target and special mission instructions.

At Air Headquarters there were three ATDs in progress at any one time. While the previous day's ATD was being executed, the ATD for the current day was finalised and issued to the tactical level headquarters for execution on the next day, and, upon its release, work commenced on the ATD which would be executed two days hence. Therefore, the Air Headquarters planners always looked two days out. This allowed sufficient time to monitor execution of the daily ATDs and adjust subsequent ones accordingly. This division of planning responsibility between the operational and tactical levels is not unlike the arrangement between the Gulf War JFACC and Headquarters Proven Force.⁶ The latter headquarters was given mission type orders and was responsible for developing the final ATOs for Proven Force operations.

The considerations that went into producing the daily ATD during PITCHBLACK'94 are illustrated in Figure 4. The Battle Staff was briefed daily by specialists in the Battle Management Group on all the factors listed in Figure 4. Subsequently, the Battle Management Group was given guidance for the ATD which was under development. The Battle Management Group and its sub-committee, the Target Selection Board, then worked up recommendations for inclusion under the various sections of the ATD which were reviewed by the Battle Staff before the ATD was drafted and formally released.

For a description of Proven Force and its operations see p 92.





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On receipt of the ATD, the tactical level headquarters began its own planning process; illustrated in Figure 5. The ATD would provide information on the background situation, detail the operational commander's apportionment decision and list the targets to be attacked in order of priority. The tactical level headquarters would consider all aspects associated with planning the actual attack. This would include coordination and deconfliction of air operations, allocation of air assets to particular tasks and weapon-to-target matching.⁷ The outcome of the tactical planning process would be the daily Air Tasking Order which would be sent to the units responsible for its execution.

Splitting the generation of Air Tasking Orders into two processes carried out in two separate headquarters of necessity introduced some duplication of effort. Air Headquarters staff producing the ATD had to establish the suitability and feasibility of attacking particular targets before they were included in the ATD. To establish the suitability of attacking these targets there was a need to examine the available range of weapons and the level and nature of damage they could inflict against the strategic objectives and limitations, as well as the Law of Taken into particular consideration were the risk of Armed Conflict. collateral damage and the possibility of civilian casualties. Establishing the feasibility of attacking potential targets involved weaponeering and balancing the available resources against the number and nature of the daily ATD tasks.⁸ At least to some extent, all these functions performed at the operational level were later repeated at the tactical level as part of the process of developing the detailed Air Tasking Order.

A duplication of effort between operational and tactical headquarters means that additional qualified staff are required. It may also mean a longer planning cycle than if the Air Tasking Order was

Deconfliction is the process of examining all planned air operations with a view to identifying and eliminating excessive tasking of, or demand for, limited resources, ensuring safe use of air space, and assuring that planned actions will not adversely interfere with one another.

Weaponeering is the weapon-to-target matching process carried out as part of the weapon selection procedure. Factors considered during weaponeering are the nature of the target, the level of damage required and the necessary kill probability (ie the probability of successful attack). Target intelligence required includes the degree to which the target is hardened and/or protected, the risk of collateral damage and civilian casualties, and the risk to own forces. From this type of information, weapons are selected and weapon loads calculated, the number of strike assets are then determined and the requirement for supporting forces established.

produced at the operational level headquarters. However. the arrangement adopted during PITCHBLACK'94 whereby the operational headquarters issued an ATD from which the tactical headquarters produced the Air Tasking Order has one important advantage; flexibility and responsiveness at the tactical level. These characteristics are particularly important where there are limited air assets available and where last minute unserviceabilities can have a marked impact on the rate of effort able to be mounted. To illustrate this point imagine a situation where on a particular day insufficient aircraft sorties can be generated to attack all the tasked targets with the required assurance of kill probability. Under the existing arrangement, the tactical air commander has the flexibility to task the available aircraft in accordance with the priorities established in the ATD and to subsequently revisit targets which were inadequately serviced due to aircraft unavailability. If the tactical commander lacked this flexibility, in the situation described, targets would not be serviced on the designated day but would need to be reprogrammed. This would create a measure of rigidity in the tasking system to the extent that opportunities could be lost to attack targets of opportunity or ones which are time-sensitive.

However, the question that arises is how the arrangement of producing Air Tasking Orders at the tactical level will work if there is more than one wing deployed into the same area of operations. It would be undesirable for each wing to generate its own Air Tasking Orders because this would introduce a significant coordination problem. One solution would be to form a single centre for the production of Air Tasking Orders in the area of operations utilising planning staff from each of the deployed wings. However, this would be virtually duplicating the operational level Air Headquarters. An alternative would be for the operational level to produce the Air Tasking Orders in the same way that it was done during the Gulf War. This latter arrangement would be fraught with the problems experienced during the Gulf War the chief of which would be delay in ATO production.

In trying to solve these sorts of problems, the danger is that they will be considered in isolation to the larger issue of the conduct of operational level warfare. Solving each small problem of this nature can provide only a partial, sub-optimal solution to the broader issue of operational level command and the Air Commander's role. What is needed is to examine this broader issue and work down through the levels of command. Such an analysis will form the subject of the next chapter.

CHAPTER TEN

CAMPAIGN PLANNING FOR THE ADF -A SYSTEMS APPROACH

The new collocated Joint Headquarters will be the centrepiece of the ADF's command and control system for prosecuting theatre level war. The creation of this headquarters has followed recognition by the ADF that there is a need for a single command focus at the operational level of war. This focus is provided in the establishment of the CJFA position. Although at present there is the rather anomalous situation where a CJFA is not appointed on a permanent basis, it would seem unlikely that this situation would persist following the formation of the collocated Joint Headquarters. A focus at the operational level of war is just as vital in peacetime as it is during hostilities because it is in peacetime that questions of force structure and doctrine formulation are addressed, and these need to be set within the context of operations. It is also in peacetime that commanders and their staff prepare to fight a war. To establish the Joint Headquarters without a permanent CJFA, therefore, would forego the opportunity to adequately prepare the operational level command and control system for warfare.

A Fresh Look at Operational Level Warfare

In giving emphasis to the operational level of war, the establishment of the collocated Joint Headquarters also presents the ADF with the opportunity to take a fresh look at the way it will conduct itself in war. This is particularly true for the operational level headquarters.

The conduct of military operations is not an end in itself but merely one of the means to achieving strategic objectives. A strategic objective is an effect that the government would like to have upon an adversary. That desired effect could be to force the adversary to withdraw his forces which may be occupying contested territory, induce him to 1

negotiate a settlement in whatever dispute is in progress, or several other possibilities. There are both military and non-military inducements which could be brought to bear upon the enemy in these situations. One nonmilitary method is diplomacy; the government could seek to gather international support which will add weight to its negotiations with the enemy state. Another non-military method is economic pressure which may be generated by trade sanctions and embargoes. Military means include the threat to use force and, ultimately, the actual use of force.



As shown in Figure 1, all these means can contribute to achieving the strategic objective. Each of the means has two important characteristics in common; they are interactive with one another and the environments in which they are pursued are dynamic. In other words, the situation in each sphere of action can change with time and as a result of a multitude of factors, not least of which are actions taken in the pursuit of other means to achieving the strategic objective. For example, during the Gulf War the application of military force by the Coalition was greatly facilitated by the local Arab nations' agreement to host foreign military forces. This was achieved through diplomatic and, to a lesser extent economic, negotiations. The conduct of the war on the Coalition side would have been significantly more difficult and costly had Coalition forces been unable to operate from the Arabian peninsula.

The approach taken here is to view the set of actions directed towards achieving the strategic objective as a system. According to one definition a system is:

'any combination of real world elements which together have a purpose and which form a set which is of interest to the enquirer.'

This systems approach mandates that the interactive and dynamic nature of the various means of achieving the strategic objectives needs to be taken into account by those responsible for coordinating activities in each sphere of action. If this is not done there is a risk that the various activities will have an adverse effect on one another and some effort could be nugatory.

The systems approach used to analyse the achievement of strategic objectives also applies to the attainment of military objectives. As illustrated in Figure 2, there are various means of achieving military objectives. These may be divided into two categories; the threat to use force, or the actual use of force. When threatening to use force one may assume a more aggressive military posture in order to add weight to a verbal threat. Such an aggressive posture may include increasing force alert levels, boosting military presence in the area of dispute, engaging in exercises that may be interpreted as a pre-war work-up of the force, etc. As an extreme action, when threatening to use force, a limited offensive military action can be undertaken to show intent. Such an action may include anything from mock air raids to a limited attack against a target of significance, for instance a fuel storage depot or other military installation.

As in the case of strategic objectives, the various means of achieving military objectives are both interactive and dynamic. Hence, the military situation is equally liable to change, either because of acts within the military sphere of activity, or because of changes within the broader context. The systems way of viewing the conduct of hostilities makes visible the interrelationships of actions and thus allows such changes to be taken into account in campaign planning. Indeed, the military appreciation is a mechanism whereby such external and internal

Wolstenholme, E.F., System Enquiry: A System Dynamics Approach, Wiley, Chichester, 1990, p 1. (Emphasis added.)

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environmental factors impacting on the military situation may be factored into the planning process.



contemplating offensive action. the operational When commander is faced with several choices in the selection of the campaign aim and the missions of the forces under command. For a start, the options available include attacking the enemy's rear, isolating the area of operations through interdiction, engaging the enemy's forces, or any combination of these. Irrespective of the course adopted, the operational commander would wish to ensure that his air forces had attained control of the air at the outset. Naturally, the strategic guidance and limitations provided by higher authority will determine the degree of freedom the operational commander has to choose any of these courses of action. Irrespective of the freedom of action afforded to the operational commander, the systems approach of analysing options and planning operations is equally valid.

Campaign Planning for the ADF- A Systems Approach

By way of illustration, consider a situation where the strategic directive is to repel an enemy lodgement on national territory. The operational commander has the options of destroying the lodgement force or neutralising its war fighting capability, thereby forcing a withdrawal. Alternatively, an escalatory approach would be to attack enemy national interests other than the lodgement force. The latter course may include attacking enemy strategic and economic targets. For the sake of simplicity, assume that escalatory measures are precluded by higher authority. Hence, the operational commander has a choice of either neutralising the combat capability of the lodgement force or, indeed, destroying this force. A third option would be the combination course of first degrading the combat effectiveness of the lodgement force before attempting to destroy it.

To achieve his mission the operational commander has available the national naval, land and air forces. These forces are limited in size and the option of directly attempting to destroy the lodgement force without any preparatory degradation of its combat effectiveness would be costly. Therefore, the operational commander decides to adopt the combination course described earlier. The question is 'how to construct the campaign'?

Using the systems approach, the planning staff establish that the first desired effect is to degrade the enemy's combat effectiveness. Next there is a need to identify all the factors which would contribute to generating that effect. Figure 3 shows three of these factors (there may be others but for the sake of simplicity they have not been shown). Each of these contributing factors translates into a military aim. The next step is to identify all the operations which contribute to achieving each aim. Each of these operations can be further broken down to establish the subordinate actions which would need to be carried out. Figure 4, for example, takes the aim of exhausting the enemy's war fighting stocks and identifies that in order to achieve that aim two actions need to be carried out; attrition of in-theatre war fighting stocks and also interdiction of resupplies. The process then continues by identifying that to interdict resupplies maritime and air interdiction will be necessary. Moreover, attrition of in theatre stocks can be achieved by destroying the enemy's stockpiles located in the theatre and by forcing the enemy to increase munitions usage through an increased rate of effort.



The systems approach to campaign planning has the benefit of showing the interrelationships between the various military actions which are undertaken. Realising that these relationships are dynamic enables planners to analyse the implications of observed outcomes and to find means of overcoming reverses. For instance, in the example illustrated in Figure 4, it is readily seen that a failure to accomplish any of the four actions at the base of the pyramid may directly impact on the desired effect. In the cited example, a successful interdiction campaign may be nugatory if the enemy has adequate supplies of munitions intheatre which, due to a pause in hostilities, are not being expended. Not all the actions identified by this method need be carried out concurrently. In fact, there may be no need, or capacity, to carry out all of the identified actions. The benefit of the systems approach is that it allows planners to identify priorities for programming specific missions, and it enables them to assess the consequences of omitting particular actions.

Arguably, the most important benefit of this planning method is that it forces planners to establish a logical connection between the desired effect and the planned actions. If the actions are successfully performed but the desired effect is not achieved, there is a clear indication that the logic used is incorrect or that other factors, not currently identified, are involved. It forms a trigger for reviewing the current plans and the underlying assumptions made in planning.



Monitoring Campaign Outcomes

A vital element of warfare is monitoring the outcomes of campaigns. Doing so enables an assessment of what has been achieved relative to what was planned. This in turn allows one to determine whether there is a need to adjust the plan or the mode of its execution. The difficult part is to identify appropriate performance measures. This is an aspect which has not been done very well in the past. The reason is that the things which are readily measured are often not the appropriate measures of performance. For instance, common measures of effectiveness are based on rates of effort, such as the number of sorties flown or the tonnage of ordnance expended. Other common measures are based on the level of damage inflicted, for example, the number of artillery platforms destroyed and the number of enemy casualties, to name but two. According to such measures American military performance in the Korean and Vietnam wars was of an exceptionally high standard. Yet the majority of American combat operations in these wars have been universally assessed to be of dubious value in terms of achieving the strategic objective. In both these wars the United States was forced to dilute its originally stated strategic objective in order to achieve a facesaving conclusion to hostilities, or 'peace with honour'.

Measures based on rates of effort and on the level of battle damage inflicted upon the enemy are valid in terms of assessing performance at the tactical level. However, at the operational level a more complete picture is required. The sole true measure of performance at the operational level is the degree to which the military objectives have been achieved. As discussed previously, these military objectives comprise the effects that the operational commander seeks to inflict upon the enemy. For instance, it is pointless counting off the number of bridges destroyed if the enemy is able to use other means of transporting combat supplies and reserve forces to the area of operations.

Having the wrong measures of performance can not only be ineffective, but it can give a false sense of achievement. Furthermore, it can lead to a misuse of combat power by continuing unfruitful operations. During the Gulf War the Royal Air Force persisted with high risk attacks against heavily defended Iraqi runways for a full week, despite an assessment by the JFACC, General Horner, that 'they ain't achieving much in relation to the risks they're taking and the effort they're putting in'.² In the words of Air Chief Marshal Sir Patrick Hine, Joint Commander of all British forces during the Gulf War, there was no point in 'going on putting holes in the runways, which they [the Iraqis] would fill in within forty-eight hours, and running the risk of losing more aircraft'.³ The risks

² Quoted in de la Billiere, P., Storm Command: A Personal Account of the Gulf War, Harper Collins, London, 1992, p 231.

³ Loc Cit. Six Royal Air Force Tornados were lost in combat during these operations in the first week of the war. In a footnote on page 208 of *Storm Command*, Sir Peter de la Billiere describes the loss of these aircraft in the following terms. '[T]wo are believed to have flown into the ground, which is hardly surprising when pilots were weaving through total darkness at two hundred feet or less to avoid defences. One aircraft was almost certainly destroyed by a bomb which exploded immediately after release, and two were hit by surface-to-air missiles - one as it

taken would not have been so noteworthy except that the Coalition had the means to achieve the desired effect, the requisite degree of air superiority, without resorting to such risky operations. Indeed, after the first few days of the air war the Iraqi Air Force simply ceased to fly.

Hence, at the operational level a more complete picture is required than a statistical summary of rates of effort and battle damage inflicted. At this level there needs to be an assessment of the effects that operations have had upon the enemy relative to the desired effects. At the tactical level it is sufficient to know whether targets subjected to attack have, indeed, been destroyed. Having this information the tactical commander can decide whether to reprogram targets for attack or whether to direct effort at new ones. However, the operational commander needs to know whether the attacks have had the desired effect or whether the enemy has been able to recover the situation through other means.⁴ With this information the operational commander can decide whether to pursue the current scheme of attack or to rethink the campaign plan. For example, consider the situation where the desired effect is to achieve air superiority and to deny the use of the air to the enemy. Assume the original plan called for runway denial operations. Finding that these operations had very little impact on the enemy's ability to fly because he was able to recover from the attacks by quickly repairing damaged runways, should trigger a review of the original plan. Perhaps more lucrative targets may be found in the form of the airfield radar system, maintenance facilities or the fuel dump. Destruction of these facilities may degrade enemy air operations for longer periods than would cratering runways which prove to be easily repairable.

Implications for the Intelligence Function

Adopting a systems approach to campaign planning and operations monitoring has significant implications for the intelligence organisation. This organisation would have the main responsibility for providing assessments of the effects that operations are having on the

For instance the enemy may negate the effectiveness of maritime interdiction operations by moving supplies and reserves using airlift or overland transport.

pulled up to a higher level some distance from the target and tossed conventional [unguided] bombs to help suppress the defences, the other as it was completing a level attack from medium altitude. The sixth aircraft was disabled by a surface-to-air missile at medium level.'

enemy. The focus would need to embrace the analysis of effects as well as monitoring battle damage assessment (BDA).⁵ The following example from the Gulf War will serve to distinguish the difference in approaches between focusing on BDA and monitoring the effects of operations. In General Schwarzkopf's words:

'After two weeks of war, my instincts and experience told me that we'd bombed most of our strategic targets enough to accomplish our campaign objectives ... But our experts, a team of "battle damage assessment" specialists from the intelligence agencies in Washington assigned to Central Command, disagreed. Their job was to analyze bombing results and tell us which targets we had to re-strike ... They'd say things like, "You failed to destroy the power plant in Baghdad"; yet we knew that in Baghdad *the lights were out.*^{*6}

Irrespective of the merits of the particular case in the above example, what is of interest is the difference in perspective between the intelligence analysts and the operational commander. General Schwarzkopf. The effects monitoring approach to intelligence entails having the ability to look beyond the BDA statistics to the implications of 'the lights being out' in Baghdad. This change in emphasis has implications not only for the way intelligence is analysed but also for the nature of the intelligence that is collected. To take the example cited: to be able to confirm the achievement of the campaign objective, the intelligence analysts would have to confirm that the lights were, indeed 'out' and that it was not an Iraqi ruse. The analysts would also have to assess the likely period for which the lights would remain 'out' and the implications that that would have for subsequent operations. This form of analysis relies only to a limited extent on battlefield imagery. There may be a need to collect information from additional sources such as covert reconnaissance, monitoring enemy communications and, in the instance of this example, monitoring the CNN broadcasts from inside Bagdhad.

⁵ The acronym BDA normally stands for *bomb damage assessment*. However, the term *battle damage assessment* is gaining currency. The broader meaning is preferred here because not all battle damage is inflicted via bombing.

⁶ Schwarzkopf, H.N. with Petre, P., *Op Cit*, p 498. (Emphasis in the original.) It was not only the Washington specialists who were concentrating on BDA to the exclusion of effects monitoring. Central Command's own intelligence staffs were also focused on BDA.
Implications for Targeting

Essential to the systems approach to campaign planning is the need to view potential targets as elements of a target system rather than considering them in isolation.⁷ A target system is a combination of facilities, structures and equipment which together form a distinct element of the enemy's war fighting capability. An example of a target system is illustrated in Figure 5.



Some of the thought underlying the ensuing discussion on target systems has its origins in Sink, J.T., *Rethinking the Air Operations Centre: Air Force Command and Control in Conventional War*, thesis submitted to the Air University School of Advanced Airpower Studies, Maxwell Air Force Base, Alabama, September 1994.

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Naturally, the example in Figure 5 is not an exhaustive analysis of the elements which together make up the enemy's munitions resupply system. However, it will serve to illustrate the main point which is that a target system is a dynamic entity made up of several interrelated parts. Neutralisation of a target system may be achieved by degrading or destroying one or more of its constituent parts. In selecting targets for attack, emphasis in the first instance, should be given to the importance of neutralising particular target systems. Such systems could include, enemy air defences, logistics support, and power generation. Determining the relative importance of the various target systems in the achievement of operational commander's military objectives the will enable the. establishment of priorities for the apportionment of effort. Once priorities have been set for attacking the selected target systems, an evaluation must be made of the importance of individual targets to each target Doing so will ensure that the most effective use is made of svstem. available combat resources by targeting those parts which for the least effort will provide the maximum return.

Planners also need to be aware that the relative importance of individual targets within a target system can change with time. To use the example in Figure 5, offensive effort may for a time be directed against storage and manufacturing facilities. However, a convoy of supplies en route to the theatre of operations, by land, sea or air, may merit a high priority while it is in transit. The reason for this is that the target is open to attack only for a finite period of time whereas manufacturing facilities and other fixed installations are generally open to attack for extended periods. Another reason for a short term reordering of priorities to attack a target of opportunity, such as a convoy, is that once it reaches its destination it could have a direct effect on the outcome of an engagement. Moreover, at the convoy's destination, the war materiel would be unloaded and dispersed making it more difficult to interdict.

Hence, the factor of time is an important contributor to the development of plans for offensive operations. In analysing the value of target systems and individual targets, their changing value with time needs to be assessed and incorporated into the planning process. In addition flexibility needs to be included in plans to allow diversion of offensive assets to attack targets of opportunity.

Implications for the Operational Level Command Structure

The systems approach to campaign planning necessitates that there is an integration of combat effort. There is no room for separate wars fought in the different areas or environments having independent aims. The systems approach to warfare demands a true orchestration of effort toward the military objectives. This has certain distinct implications for the command structure at the operational level of war. Of primary importance is that this structure needs to facilitate truly integrated effort.

Obviously, there needs to be a single operational level commander having responsibility for the conduct of the conflict in his designated area of responsibility. Also, there is a need for a single battle staff supporting the operational commander and having the responsibility of creating the overarching campaign plan and ensuring a coherent approach to planning by subordinate commanders. Supporting plans may be developed separately, however, there needs to be a capability to review all such plans to ensure that nothing is omitted and that only that level of redundancy consistent with an effective use of available combat resources is included. Moreover, the degree to which the supporting plans complement one another needs to be established. This is the function of the operational commander and his battle staff.

possible forms that the operational There are two commander's battle staff could take. One option is to create an extensive joint planning staff that will respond directly to the operational commander. This course offers the potential benefit of ensuring that there will be a fully integrated planning effort in creating the overarching However, there are several problems with such an campaign plan. arrangement. First, there is the potential of duplication of effort between the operational commander's planning staff and those of the component This situation not only introduces inefficiency but also commanders. could result in friction between the various staffs if one or another group is seen to be encroaching in the others' areas of responsibility. Additionally, there is a potential for the operational commander to be receiving conflicting advice. Moreover, if the operational commander were obliged to manage a full planning staff it would detract from his ability to concentrate on running the conflict.

An alternative is for the component commanders to act as the operational commander's battle staff. Their role would be to provide specialist advice to the operational commander in the creation of the overarching concept of operation for the conflict which will form the basis for the campaign plan. Detailed planning and monitoring of operations could then be carried out by the component commanders' own staff with division of responsibilities between the various the component headquarters' staffs to be decided by the operational commander and his component commanders. Although there are two potential pitfalls in this arrangement, both of these are overcome by the establishment of the collocated joint headquarters. The first potential problem is that there will be a lack of coordination between the various component headquarters' However, the proximity offered by collocating these staffs will staffs. facilitate ready communication and enhance the coordination achieved. The second potential problem is that pre-existing service rivalries and misconceptions will prevent a ready flow of information and exchange of ideas between the component staffs. The obvious way of overcoming this problem is to make the component headquarters truly joint by manning them with joint staff. The ability to communicate and appreciate other services' perspectives will be significantly enhanced with the existence of joint staff. A review of all plans by the operational commander and his component commanders would ensure that there was the necessary degree of coordination between the operations carried out by the component commands.

Vital to both an integrated planning effort and a review of plans produced by the various component headquarters staffs is a coherent intelligence picture. The need is for an intelligence picture set within the context of operational level warfare; one which is able to provide the basis for systems campaign planning. Such an intelligence picture could only be developed if all inputs are compiled at a single point. Experience in Korea, Vietnam, and more recently, the Gulf War has shown that where there are multiple intelligence centres providing assessments, there is little chance of agreement between them. Such a situation would generate confusion and add to the fog of war. A single, joint intelligence establishment would avoid the problem. The existence of such a facility would also mean that the component commanders are all using the same intelligence picture.⁸ This should enhance the complementarity of component force operations and allow a common interpretation of shifting operational priorities which in turn would facilitate communication between component commanders.

A Joint Intelligence Centre (JIC) and a Joint Reconnaissance Centre were operating in the Gulf War. The need for a JIC has been recognised by the United States Pacific Command Air Force and more recently by General Sanderson, CJFA designate, and by RAAF Air Headquarters.

Employment of Air Power - Targeting and Apportionment

The systems approach to campaign planning suits the application of air power at the theatre level. Air power, more than the other forms of combat power, has the potential to operate across the breadth and depth of the area of operations, carrying out a variety of concurrent operations. Air power is equally able to act independently or in combination with land and maritime forces. As discussed previously, for this reason and because there is a high demand for air power, the adoption of a systems approach will ensure that air power is effectively used in accordance with priorities designed for maximum exploitation of the air environment.

The systems analysis involved in campaign planning and target system evaluation enables the Air Component Commander to develop an air power apportionment formula for consideration by the operational commander. Hence, an air component commander needs to be intimately involved in the development of the overarching campaign plan. This also applies to the other component commanders and for the same reason; they need to understand *and influence* the creation of the overarching campaign plan. Component commanders are not only intimately familiar with the capabilities and preparedness levels of their operational units, but they are in the best position to advise on the nature of tasks and rates of effort of which their units are capable.

This is particularly important for air power because it is the most versatile and flexible of the combat elements. The employment of air power must exploit the multi-role, multi-mission capabilities of its assets. Naturally, the most hotly debated issues in planning offensive air operations are targeting and apportionment. This is because these functions do not impact only on air power operations but also on the operations of the surface forces. Therefore, all component commanders have a vested interest in the apportionment of air effort and in the selection of targets for air operations.

This matter was the subject of an active debate during the Gulf War as it has been at other times. The JFACC was constantly criticised by the Army and Marine Component Commanders for not attacking their proposed targets. Thus, a Joint Targeting Coordination Board (JTCB) was formed to ensure an adequate targeting plan was created in accordance with the operational commander's apportionment decision and without neglecting the requirements of the surface forces. Although not currently written into ADF doctrine, a proposal has been put forward to establish a similar body to the JTCB, called the Joint Offensive

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Support Advisory Group (JOSAG).⁹ The proposal for a JOSAG was aimed at overcoming any perceived air force bias in the priority afforded to providing offensive air support. The discussion paper proposing the JOSAG quoted Gulf War experience in support of the proposal. The question arises as to whether the establishment of a JOSAG, or a similar body, would add value to ADF joint operations. Related issues are; how a JOSAG would be incorporated into the structure of the collocated Joint Headquarters, what would be its role, at what rank level should membership be set, and what bearing should JOSAG outcomes have on air operations.

Before examining the issues pertaining to the establishment of a JOSAG, it is useful to take a closer look at the status, role and constitution of the JTCB that operated in the Gulf War. There were several noteworthy features of the Gulf War JTCB. First, its membership was not fixed at such a level as to challenge the authority of the operational level commander, General Schwarzkopf: JTCB members were of Colonel (equivalent) rank. Second, the JTCB did not have executive authority. That authority was vested in the operational commander who reviewed target lists prepared by the JTCB to ensure that they complied with his apportionment directive. Third, the JTCB had no influence over the master target list which was at the core of the air strike plan developed before the war started. These characteristics ensured that effective use was made of the JTCB in the Gulf War. Unity of command was ensured because the authority of the operational commander was not undermined by the existence of the JTCB, rather it became a tool for maintaining harmony between component commanders. Unity of effort was also assured because the JTCB gave each component the opportunity to argue its own cause while being bound by the outcome. Most importantly, maintenance of the aim was assured because the direction of the campaign plan, including the air strike plan, was unaffected by JTCB recommendations.

Overall it can be said that the JTCB was made to work during the Gulf War. However, a word of warning for the ADF. There are such vast dissimilarities between the ADF and United States forces in size, force structure and in the scale of operations as to give cause for caution. The United States military organisation has four air forces each of which is at least an order of magnitude larger than the total air power assets of the ADF. With such vast resources, American commanders have the luxury of

⁹ A discussion paper proposing the formation of a Joint offensive Advisory Group was circulated for comment under cover of ACOPS BQ6285/93 of 14 September 1993.

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allocating portions of their air resources to various areas of operation or to various campaigns and roles. Therefore, the greatest problem facing the United States in joint air operations is one of coordination.

By contrast, the ADF needs to carefully husband its limited The conduct of offensive air support operations air power resources. must, therefore, be considered within the context of the overall campaign plan and the relative priorities afforded by the operational commander to the entire range of air roles. This is particularly important where concurrent air operations using multi-role aircraft, such as the F/A-18 and the F-111C, are planned. Hence, the establishment of a JOSAG or similar body must be approached with care. Such a group should not in any way usurp or undermine the operational commander's authority to approve the campaign plan and set guidance for air operations. The decision for the apportionment of air effort must remain with the operational commander. The ability to plan and execute air operations in accordance with the campaign plan and the operational commander's apportionment directive must rest with the Air Component Commander. Any other arrangement would result in a dysfunctional break up of command authority and a detrimental division of effort.

In the Australian context, a JOSAG could be of value to the operational commander and to the Air Component Commander, if it is established as an advisory staff group in pre-conflict planning. After hostilities are initiated, the JOSAG role would be to monitor the progress of the campaign advising the operational commander on the need to adjust the targeting and apportionment plans. Placing the JOSAG in the collocated Joint Headquarters under the operational commander, and not in any one component headquarters, should eliminate any suspicions about the proclivities of any one service to disadvantage the others. Staffing of such a group is a particularly sensitive area. What is needed are staff who will bring the expertise of their service to bear on joint issues to enhance the synergy of joint operations; not staff who are there to ensure that their service view prevails. That said, in a collocated Joint Headquarters where the Air Component Commander's staff is truly joint and where the operational commander acts with the advice of all Component Commanders, the need for a JOSAG may not exist.

Conclusion

The creation of the collocated Joint Headquarters will give a much needed focus to the operational level of war within the ADF. The

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opportunity thus afforded must be utilised to re-examine the organisational aspects associated with the establishment of such a headquarters. As well, a much more profound examination is needed of the way the ADF will conduct itself in war. Fundamental to such an examination is the core issue of the philosophy underpinning campaign planning. Organisational structures and procedures need to be put in place which will introduce some order to the chaos of war while allowing a measure of flexibility and responsiveness to the changing conflict situation.

Adopting a systems approach to campaign planning and target system analysis will assure that the dynamic relationships between the various activities of war and the various constituent parts of the enemy's combat capability are given their due regard in the planning process. Adopting the systems outlook has certain implications for the intelligence function and for the manner in which the progress of the campaign is monitored. Importantly, the systems approach also has implications for the operational level command structure. The employment of air power as a theatre level resource is especially suited to the systems campaign planning approach. The latter is of particular relevance to air effort apportionment and target selection.

The opportunity afforded by the creation of the collocated Joint Headquarters should, thus, be utilised to re-examine the philosophy underlying the conduct of warfare at the operational level by the ADF. Adoption of a systems outlook in campaign planning has the potential to enable the force to operate in a genuinely integrated fashion.

CHAPTER ELEVEN

THE JFACC ROLE IN ADF AIR OPERATIONS

Joint Force Air Component Commander - Some Key Issues

A component command structure may not have to be adopted in every situation. For instance, in low intensity conflict where the scale of operations does not warrant a component command organisation, an integrated command structure under direct control of the operational commander may be more appropriate.' When a component structure is adopted, the Joint Force Air Component Commander (JFACC) would be under the command of the operational commander given overall responsibility for the conduct of the campaign. Depending on the command arrangements approved by the CDF, the operational commander may be a CJFA, one of the Joint Commanders appointed to assume a lead role, or a Joint Force Commander such as COMNORCOM. When a CJFA is appointed, the JFACC would normally be ACAUST. However, if the operational commander is either a lead Joint Commander or a Joint Force Commander, the JFACC function may be assigned to another officer. Irrespective whether ACAUST or another officer is designated the JFACC, there are a number of issues which need to be resolved:

- . from where does the JFACC derive his authority?
- what would be the nature of the operational authority vested in the JFACC?
- . what would be the JFACC's responsibilities?
- how does air operations planning relate to higher level planning activity?

ADFP 1, Op cit, p 8-2, para 804.

- what are the requirement for an effective organisational structure within the JFACC headquarters?
- what would be the functional relationships between JFACC staff and those of other component headquarters?

These issues will be discussed below.

JFACC's Operational Authority

As discussed earlier, the JFACC comes under the command of the operational commander and is formally designated by the latter. Hence, the JFACC derives his authority from the operational commander. The latter would also delineate the nature of the operational authority vested in the JFACC and the range of responsibilities associated with that function. Both the authority and responsibilities of the JFACC would be tailored to the particular conflict situation and would be based on the operational commander's concept of operations and the overarching campaign plan.

Current joint doctrine allows the operational commander to delegate operational control, which also encompasses tactical control, to a subordinate commander.² Hence, the JFACC would normally be delegated operational control of assigned assets.³ Operational control would authorise the JFACC to assign assets for 'specific missions and tasks which are normally limited by function, time or location'.⁴ It would also

Tactical control is defined in ADF doctrine to be the detailed and usually, local direction and control of movements or manoeuvres necessary to accomplish missions or tasks assigned. For example, tactical control of the critical part of a close air support mission may be assigned to a forward air controller even though the JFACC may have raised the tasking. (ADFP 1, *Op Cit*, paras 749-750, p 7-10.)

ADFP 1, Op cit, paras 743-745 p 7-9.

Ibid, para 746, p 7-9.

Operational control in ADF doctrine is the authority delegated to a commander to direct forces assigned so that the commander may accomplish specific missions or tasks which are usually limited by function, time or location; deploy units concerned and retain or assign operational control or tactical control of those units. It does not include authority to assign separate employment of components of the units concerned. Neither does it, of itself, include administrative or logistic control. (ADFP 1, *Op Cit*, p 7-9, para 746.)

entitle the JFACC to delegate operational control or tactical control to his subordinates but not to re-assign missions or tasks.⁵

The assets and forces assigned to a JFACC, naturally, would depend on the nature of the conflict. Generally speaking, RAAF operational units which would normally remain under ACAUST's command during operations are the Strike Reconnaissance Group, the Tactical Fighter Group and the strategic elements of the Air Lift Group.⁶ Officers other than ACAUST who are designated JFACC would normally have a more limited span of control. For instance, in the situation where air operations were to involve almost exclusively a single Force Element Group, the Group Commander may be designated the JFACC. In that situation the Force Element Group Commander would have operational control of his own Group and possibly more limited authority over discrete elements of other Groups assigned to him from time to time for specific tasks or missions. The JFACC may also have operational control of non-RAAF forces, for example elements of No 16 Air Defence Regiment.

JFACC Responsibilities

The exact nature of the JFACC's responsibilities would be defined by the operational commander. These responsibilities will vary depending on the situation, and the operational commander's campaign plan and particular requirements. Accordingly, it is not possible to be prescriptive in any way regarding the nature of the JFACC responsibilities. However, these responsibilities may be discussed in general terms. The JFACC is the operational commander's specialist on air operations who should have an understanding of the capabilities and limitations of the assigned air elements relative to the nature of the campaign objectives pertaining to the employment of air power. Therefore, the JFACC is well placed to advise on the most effective use to which the available air power may be put based on the operational commander's objectives. This would include providing advice in respect of the apportionment of air effort and the allocation of air assets to specific tasks, missions and locations. Naturally, this advice would be developed in consultation with the other component commanders and with the operational commander himself. The second area of responsibility which the JFACC may be assigned is the planning, coordination, allocation and tasking of air assets based on the

Ibid, para 748, p 7-9.

Ibid, Chapter 5, Annex C, para 6.

operational commander's apportionment decision. This would provide centralised direction for the allocation and tasking of air missions.

Apportionment and air targeting are aspects that generate debate among component commanders. The apportionment decision rightly belongs to the operational commander. However, while air targeting needs to accord with the apportionment decision and the operational commander's targeting priorities, on a day to day basis there is a need for a measure of flexibility in the specific targets to be attacked. This flexibility is essential to effective air operations and should not be eroded. Where tasked targets are not executable by reason of weather, technical difficulties, air defences, or other factors, secondary targets are normally designated for air attack. Therefore, the JFACC needs to have some discretion to enable effective employment of air assets available for tasking.

In the past, surface force commanders have expressed dissatisfaction with air commanders' targeting decisions. The 1991 Gulf War was no exception. During Operation DESERT STORM, Marine and Army senior commanders complained that an inadequate proportion of their nominated targets appeared on the daily ATO. The root causes of this problem are instructive and merit closer examination.

There were two primary causes for the dissatisfaction expressed by ground commanders during DESERT STORM. The first root cause of the dissatisfaction of the ground commanders was that target selection during the Gulf War was greatly influenced by the CINC, General Schwarzkopf.⁷ The decision to attack Iraqi tanks and armoured vehicles ahead of Iraqi artillery (against the wishes of especially Lieutenant General Franks, Commander VII Corps) was made by Schwarzkopf and not the Schwarzkopf's ground concept of operations relied on an JFACC. envelopment of Iraqi ground forces and thus the primary objective of 'tank plinking' was to erode the mobility of the enemy forces. The ground commanders who would have to advance in the face of enemy artillery fire, naturally, preferred air power to concentrate on degrading this enemy capability that barred their line of advance. Ground commanders were also unaware that the CINC, General Schwarzkopf, directed that no further air attacks be made against enemy units at less than 50 per cent strength, and that air attacks in certain zones be restricted to ensure that the Coalition's attack plan was not compromised. The complaints by VII Corps would appear to indicate that its commander was unaware of these

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Winnefeld, J.A., Niblack, P., and Johnson, D.J., Op Cit, pp 82-83. Conduct of the Persian Gulf War, Op Cit, p 246.

restrictions on air targeting.⁸ Hence, one root cause of the dissatisfaction with air targeting was an inadequate understanding or acceptance by the ground commanders of the operational commander's intent, and a lack of appreciation of the extent to which the former influenced air target selection.

Several inadequacies in the intelligence system were the second fundamental cause of the air targeting controversy. First, there did not appear to be an agreed standard for the currency of intelligence information required for mobile targets. Nominated targets which were unconfirmed and others which had not been recently validated were discounted by the JFACC planning staff, although this does not appear to have been appreciated by VII Corps.⁹ Additionally, VII Corps intelligence typically was 'two to three days' behind that of the operational headquarters and by the time some targets were nominated they had already been attacked on previous days.¹⁰ Other targets declared to have been destroyed by the Air Force were not removed from the targets list by VII Corps, if there was not an exact match in the location coordinates reported by the USAF and those listed by the Corps.

The ground commanders' dissatisfaction with air targeting was addressed during DESERT STORM, not by addressing the root causes of the problem, but by introducing a system of adjudication in the form of the Joint Targeting Coordination Board under the chairmanship of the DCINC. While this was a placatory measure, it left the underlying root causes of discontent unresolved. In one respect, the JTCB was a retrograde step in the relationship between the Air Force and ground forces because it reinforced their adversarial posture. Although not a direct cause of the problem, the fact that the JFACC planning staff was essentially manned by Air Force personnel would have fuelled any suspicions that may have arisen in the minds of the ground commanders.

A preferable solution would have been to address the root causes of discontent; inadequacies in the downwards communication of the CINC's intent and guidance, and the deficiencies in the intelligence system. The creation of a genuinely joint planning staff in the JFACC headquarters would have also assuaged any suspicions. For the ADF, the way ahead should be to address these fundamental issues rather than

Loc cit.

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Lewis, R.B.H., Op Cit, pp 19.

Ibid, pp 17-18.

importing the JTCB concept. Of primary importance should be the need to ensure that the operational commander's intent and guidance with respect to apportionment and air targeting are transparent to lower levels of command. Equally vital is the need to have all components and command levels operating from the same intelligence picture and to ensure that the standards of intelligence required for air targeting are understood and incorporated into standard operating procedures.

If these measures are put in place, the need for a joint targeting board, or equivalent body, ceases to exist because there is already a capacity for balanced targeting and a common awareness of the intelligence situation. Moreover, effective advocacy for all components' air targeting requirements should be embedded in the organisation through the access component commanders have to the operational commander, through component liaison procedures, and through the establishment of joint staffs in component headquarters.

Air Operations Planning¹¹

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Joint air operations are an integral part of the execution of the operational commander's overarching campaign plan. The starting point of air operations planning, therefore, is the operational commander's campaign plan, his directives, and guidance in relation to the employment of air power, including the apportionment decision. The task of the JFACC is to develop an air operations plan for employing the available air effort, in accordance with the operational commander's apportionment decision, to achieve the strategic objectives. The objective of the air operations plan is to make clear the commander's vision and intent, to present a sequenced schedule of major air operations, and to detail subordinates missions, tasks and responsibilities.¹² The air operations plan should thus act as the medium for translating the operational commander's strategic objectives into the tactical missions of operational air elements.¹³ Two fundamental principles that should be observed in the development of an air operations plan are that it should: support achievement of the overarching campaign plan; and reflect an

¹¹ Air operations is used in preference to air campaigns in order to avoid any confusion with the generic air campaigns referred to by RAAF air power doctrine.

¹² Waters, G., and Stephens, A., *Op Cit*, p 11.

¹³ Loc cit.

orchestration of air, sea and land operations.¹⁴ The planning process follows the Appreciation (or Estimate) procedure described in Chapter 3.

An operations plan format has been proposed by Waters and Stephens.¹⁵ An important element of the air operations plan will be the phasing of air operations in relation to each other and to the phases of the overarching campaign plan. Normally, control of the air will constitute the first phase of the air operations plan. Attaining control of the air is not an end in itself, rather, it is a means to an end and as such is useful only if one is able to exploit it to gain an operational advantage over the enemy. The objective is to gain and maintain the degree of air superiority which will enable the joint force to conduct its planned operations relatively free from air threat. The effort expended in attaining air superiority will vary depending on the extent to which the enemy is able to contest control of the air. There should be an awareness that the air operations plan supports and is *supported by* the other components and the execution of their individual missions. Hence, there is a need to ensure appropriate synchronisation of all components' operations.

Effort that should be programmed for air operations such as strategic strike, interdiction and close air support will be determined by the operational commander's apportionment decision. However, for air strike and interdiction operations, priorities should be set against each of the identified targets. Considerations appropriate to ADF air targeting are discussed in Chapter 12.

The sustainability requirements associated with the effective execution of the air operations plan also need to be clearly detailed. This is important where key logistics support may be necessary from the various components and may impinge on their ability to execute their missions. This is particularly relevant in the situation where two or more components share either weapons or support systems and facilities.

Hence, a good air operations plan must satisfy the following criteria:

- . it must comply with strategic guidance,
- it must be in accordance with the operational commander's guidance and directives,

¹⁵ Ibid, Annex A.

¹⁴ Loc cit.

- . it must support the operational commander's campaign,
- . it must focus on the enemy's centres of gravity,
- . it must integrate and synchronise air operations with those of the other components,
- . it must be achievable and sustainable given the capabilities and limitations of the available air power and the support system,
- . it must be capable of adapting to change,
- . it must not contravene the law of armed conflict, and

it must not contravene treaty agreements or risk damage to alliance relationships unless expressly authorised by strategic guidance.

The JFACC Team

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The key to effective air operations planning is the team that is assembled to develop the plan, direct and monitor its execution and assess its outcomes. The planning team should include competent representatives from all force elements contributing resources to the air operations.

The assembled air operations planning team will need to provide expertise in a broad range of areas including:

- . air combat operations,
- . air weapons systems and munitions,
- . electronic warfare,
- . targeting,
- . surveillance and reconnaissance,
- . air lift and air refuelling,
- . logistics,
- . administrative support,

- deception planning,
- . meteorology and oceanography,
- . combat search and rescue,
- . aeromedical evacuation and evacuation of civilians,
- . communications and computer systems,
- . intelligence,
- . international political affairs and public affairs,
- . legal,
- . joint doctrine and air power doctrine, and
- . other components' operational capabilities.

There are three key functions that need to be performed within the JFACC organisation: air operations planning, current operations direction and monitoring, and operations effects analysis and assessment. The structure adopted within the JFACC headquarters needs to be such that it allows for a free interaction and cooperation between the various groups carrying out these functions. This will ensure that a cohesive set of air operations is able to be planned and executed and that the analysis and assessment cell will provide the necessary inputs into the planning elements to enable effective planning. It will also ensure that the transition from planning to execution is smooth.

Within the JFACC organisation there should also be liaison cells from the other components to provide advice on the compatibility and synchronisation of the proposed air operations with those of the other components. The liaison function is vital to ensure that the operations of all components form a cohesive coordinated campaign. Accordingly, the liaison officers should have sufficient rank status and experience to be able to speak with some authority, and have access to the higher command levels of the JFACC organisation. While this liaison function enables formal communication between component headquarters, informal interaction should be encouraged at all levels between these headquarters. Doing so will develop a team approach to operations planning and improve the coordination and compatibility of operations.

AUSTRALIAN AIR POWER IN JOINT OPERATIONS

To facilitate such formal and informal contacts, there is a need for compatible, secure communications between component headquarters.

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CHAPTER TWELVE

AN AUSTRALIAN PERSPECTIVE ON TARGETING¹

Target selection is a key aspect of the operational art. The objective of the target selection process is to ensure that the available combat power is employed both effectively and efficiently. Because air power is usually a limited resource which has to be spread across a wide range of roles and missions, target selection for air power offensive operations becomes a critical consideration at the operational level of war. Air power target selection can mean the difference between a brief, decisive conflict and a long drawn out affair where victory may come at too high a price. There have been numerous examples in past campaigns where target selection has been instrumental in deciding the outcome of campaigns and determining the duration of hostilities. Operation STRANGLE II which took place during the Korean war is but one such example which may be used to illustrate some of the key issues associated with targeting.²

In the ten months between August 1951 and May 1952, US air power prosecuted an air interdiction campaign against the North Korean Peoples Army (NKPA) rail supply effort. The objective was to so isolate and weaken the NKPA front line forces that they would either be forced to withdraw or risk being routed in an Eighth Army ground offensive. The rail interdiction campaign, which later came to be known as Operation STRANGLE II, was fatally flawed and doomed to failure from the outset. There were several problems plaguing Operation STRANGLE II but two key flaws were that, given the prevailing situation, the wrong

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Operation STRANGLE was the codename of the road interdiction campaign which preceded the rail interdiction campaign discussed here. A separate codename was not assigned to the latter campaign and Operation STRANGLE II appears to have been adopted by writers in an effort to distinguish between the two interdiction campaigns.

An early version of this chapter was published as Air Power Studies Centre Paper No 22 in April 1994, under the title of *The Art of Targeting - Attacking the Centres* of Gravity.

centre of gravity was selected for attack and the weapons used were inadequate for the desired purpose.

By late 1951 ground activity in the Korean theatre had significantly decreased and the NKPA had assumed a static defence posture. Consequently the NKPA supply requirements had decreased to a mere fraction of what they had been. As the USAF official history notes, this was not the ideal circumstance for prosecuting an interdiction campaign.

'As was the case in World War II, the best time for an interdiction campaign was when the ground situation was fluid, the fighting intense, and the enemy's logistical needs were greatest'.³

World War II experience had also shown that cutting railway lines was extremely difficult without the guided bombs that were to be a later development.⁴ It was, therefore, questionable whether an air interdiction campaign against the North Korean rail system would so affect enemy sustainment operations as to achieve the desired aim of forcing a retreat.

Operation STRANGLE II *did* reduce enemy rail transport to between 4 and 5 per cent of its prewar levels, but the supplies that got through via rail and other means were sufficient to supply the NKPA's needs, and indeed, some stockpiling was possible.⁴ Moreover, the NKPA were particularly inventive in negating the effects of damage to the rail system. They used their not inconsiderable manpower resources not only to transport supplies but also to preposition teams at vital points that could either repair damaged rail lines or construct by-pass bridges. Most importantly, though, the NKPA moved anti-aircraft assets to defend the rail network. During the operation anti-aircraft fire accounted for 243 American aircraft lost and 290 severely damaged.⁶

⁵ Futrell, *op cit*, p 436.

³ Futrell, R.F., *The United States Air Force in Korea*, revised edition, Washington DC, Office of Air Force History, 1983, p 704.

⁴ Statistical analysis showed that only 12.9 per cent of ordnance dropped during Operation STRANGLE II had any effect on the rail system.

⁶ Kirtland, M.A. 'Planning Air Operations: Lessons from Operation Strangle in the Korean War', *Air Power Journal*, Summer 1992, pp 37-46.

An Australian Perspective on Targeting

There are several other examples where inappropriate targeting had outcomes similar to those of Operation STRANGLE II: failure to achieve the objective; unnecessarily prolonged period of hostilities; and, high attrition of own forces. Determination of the guiding principles supporting the art of targeting is therefore important. It is particularly important for small to medium sized military forces, such as the Australian Defence Force, which have only limited air power resources available.

While the ensuing discussion is set within the context of the operational level of war, there is no underlying assumption made as to the intensity of hostilities. The contention is that the principles discussed here apply equally, irrespective if hostilities are classed as low or high intensity or any level in between. The reason is that irrespective of the level of conflict, the fundamental characteristics of warfare remain unchanged. That is, there will always be the need to satisfy a military objective against an enemy, while using only allocated combat resources and operating within constraints imposed by the civilian and military leaderships. Moreover, while the following discussion is focused on the application of air power in war, the principles of centre of gravity analysis and the target selection process which are outlined could be applied with little adjustment to the employment of other forms of combat power.

Back to First Principles - The Classical Theorists

In looking for guidance perhaps it is right that the first word should belong to Sun Tzu. The suggestion has been made that when Sun Tzu addressed target selection his perspective was the grand strategic and strategic levels of war at a point before actual hostilities commence and where diplomacy and not military force is the mode of conflict.⁷ That may be the case but Sun Tzu's advice *does* have some bearing on the operational level of war and specifically on targeting.

Sun Tzu explains that the 'supreme importance in war is to attack the enemy's strategy ...The supreme excellence in war is to attack

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Handel, M.I., Masters of War: Sun Tzu, Clausewitz and Jomini, Frank Cass & Co Ltd, 1992, pp 42-43.

the enemy's plans'.⁸ We can see the wisdom of these aphorisms by another look at Operation STRANGLE II.

Operation STRANGLE II began in August 1951, just as armistice negotiations got under way, so the operation was designed to comply with the Joint Chiefs of Staff requirements not to put these negotiations at risk.⁹ However, the ineffectual outcomes of Operation STRANGLE II allowed the Communist negotiators to 'stall for time hoping that the UN bargaining position would weaken under the strain of mounting casualties and losses'.¹⁰ Although there were other factors at play, the subsequent redirection of the air interdiction campaign from targeting the rail network to targeting the North Korean dams was a major influence which drove the Communists to begin negotiations in earnest. The reason was that attack of the dams caused flooding of the country's rice crop (and incidentally the railway system!) posing a threat of mass starvation which the NKPA could not defend against." For as long as the UN persisted with Operation STRANGLE II, they danced to the enemy's tune and fought in accordance with his plan rather than working to defeat it.

After emphasising the importance of attacking the enemy's plans, Sun Tzu advises that the next best thing is to 'disrupt his [the enemy's] alliances'.¹² An example of this strategy was Saddam Hussein's Scud attacks on Israel during the Gulf War. There was grave concern among Coalition leaders that these attacks would provoke an Israeli retaliation (as Saddam hoped) and thereby shatter the fragile coalition of Arab nations supporting the UN's cause. Saddam's strategy was defeated by the redeployment from Europe of Patriot missile defence systems to defend Israel against Scud attacks.

Sun Tzu's third priority in targeting is attacking the enemy's fielded forces. By contrast, both Clausewitz and Jomini identify the

- ¹⁰ Clodfelter, M., *Op cit*, p 22.
- ¹¹ *Ibid*, pp 22-23.

¹² Sun Tzu, *Op cit*, p 78.

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⁸ Sun Tzu, *The Art Of War*, (Trans) S.B. Griffith, Oxford University Press, 1971, pp 77-78.

⁹ Message, 98713, Joint Chiefs of Staff to CINCFE, 11 August 1951 stated in part, 'If Armistice discussions fail, it is of greatest importance that clear responsibility for failure rest upon the Communists.' Quoted in Kirtland, M.A., Op cit, p 39.

enemy's army as the *first* targeting priority, indicating that their starting point is post-diplomacy when hostilities have either started or are imminent. Therefore, Clausewitz and Jomini are essentially not in conflict with Sun Tzu; all three of the theorists perceive attack of the enemy army to be the first priority *once hostilities commence*.

In identifying the enemy's army as the target of first priority, Sun Tzu, Clausewitz and Jomini merely reflect the times in which they were writing. Clausewitz and Jomini, in particular, formulated their theories during the days of massed armies meeting on the battlefield when the only way to reach the enemy's industrial base, centre of communications, populace or military and political leadership was to first defeat his army. Sun Tzu, writing in the sixth century BC, operated under the same handicap.



Clausewitz and Jomini's theories of war are coloured by the physical limitations in the speed of manoeuvre and reach which applied in the days of massed surface forces, where the possibility did not exist of easily by-passing or circumventing (or indeed over-flying) the enemy's fielded forces to attack his other, and more important, centres of gravity.

Yet at the conceptual level Clausewitz and Jomini make an important contribution through their development of the idea of centres of gravity. The term centre of gravity was borrowed by Clausewitz from Newtonian physics in an effort to emphasise the importance of target

selection to the success of campaigns. Clausewitz defines the centre of gravity to be '... the hub of all power and movement, on which everything depends ... the point against which all our energies should be directed' and adds the rider that 'if the enemy is thrown off balance, he must not be given the time to recover.'¹³

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Clausewitz, C. von, Op cit, pp 595-596.

While Clausewitz here conjures up an image of a single all important centre of gravity, Jomini acknowledges the existence of more than one such centre by referring to the attack of 'decisive strategic points' or 'decisive objectives'. According to Jomini a fundamental principle regulating the employment of forces is 'to strike in the most decisive direction', that is, in the direction 'leading straight to the decisive points'.¹⁴

As previously stated, both Clausewitz and Jomini reflecting the state of warfare of their time, identify the enemy's army as constituting the single most important centre of gravity. However, their selection of the second priority for attack is of more interest here. Clausewitz and Jomini again agree in selecting the enemy's capital as the second most important target for attack. In explaining the rationale behind this choice Clausewitz and Jomini echo one another's words:

Jomini: 'All capitals are strategic points, for the double reason that they are not only centres of communications, but also the seats of power and government.'¹⁵

Clausewitz: advocated 'seizure of his [the enemy's] capital if it is not only the centre of administration but also that of social, professional, and political activity.'¹⁶

These two statements are quite telling. The importance of capitals as centres of gravity does not reside in their status as national capitals but in their being seats of power and government, and centres of communications and administration etc. These are the true centres of gravity that both theorists recommend for attack. It just so happened that in Clausewitz and Jomini's times, the seat of government, and the centres of communications and administration were all concentrated in national capitals.

Interestingly, Sun Tzu warned against attacking cities but characteristically did not explain his reasoning for doing so. Perhaps an explanation for the apparent conflict on this point between Sun Tzu on the one hand, and Clausewitz and Jomini on the other, may be found in the fact that European cities of the late eighteenth and early nineteenth centuries were totally different in nature to those found in Sun Tzu's

¹⁶ Clausewitz, *Op cit*, p 596.

¹⁴ Jomini, A., Baron de, *The Art of War*, trans. Mendell, G.H. and Craighill, W.P., Greenwood Press, 1977, pp 328 and 331.

¹⁵ *Ibid*, p 87.

China. In the Europe familiar to Clausewitz and Jomini cities had become centres of government, industry, and communications to an extent beyond Sun Tzu's capacity to foresee from his vantage point in the China of the sixth century BC.

The Air Power Theorists

Douhet opens the first chapter of his text 'The Command of the Air' with the words 'Aeronautics opened up ... a new field of action, the field of the air. In so doing it of necessity created a new battlefield'.¹⁷ This new battlefield is characterised by three dimensional manoeuvre and a quantum leap in the flexibility, the speed of application and the reach of military power.



The new capability to by-pass massed surface forces and 'strike direct and immediately at the seat of the opposing will and policy' opened up new vistas for military theorists; among them Douhet, and Liddell Hart.¹⁸ As the potential for exploiting the third dimension became better understood, doctrine was developed to reflect the contribution that the air component could make to campaigning in the form of air bombardment, control of the air and the tactical application of air power in support of the surface battle. The targets against which air power is directed continue to

be the same centres of gravity identified by the classical theorists, including the enemy's armed forces, leadership, war fighting infrastructure and population. The difference is that the priorities are now able to be altered in that the defeat of the enemy forces does not necessarily have to precede attacking the other centres of gravity.

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¹⁸ Liddell Hart, B.H. (Sir), *Paris or the Future of War*, Kegan Paul, Trench, Trubner & Co Ltd, London, 1925, p 43. (Emphasis in the original.)

Douhet, G., *The Command of the Air*, trans by Ferrari, D., Office of Air Force History, Washington DC, 1983, p 3.

A Logical Foundation for the Art of Targeting

The objective of using military force is to coerce the enemy to accede to the demands made of him. So long as the enemy has the ability to resist militarily, he cannot be forced to comply with any such demands. Therefore, the purpose of striking at the enemy's centres of gravity is to convince the enemy to cease hostilities by degrading his ability to resist militarily. This ability is supported by two factors: the enemy's capacity to wage war and his will to continue doing so. The targets selected for attack must be ones which have a bearing on one or both of these two elements of the enemy's ability to continue to fight.

In selecting targets for attack, the starting point for all considerations must be the grand strategic and strategic objectives. At the grand strategic/strategic level the Rules of Engagement (ROE) are set and the impact of the LOAC on the conduct of operations is determined. Hence, not only the strategic objectives but also ROE and LOAC considerations will impose constraints on the application of combat power and both the objectives and the nature of the constraints can vary as the For example, during the Korean War the US grand war progresses. strategy vacillated as the political leadership changed. In June 1950 President Truman's avowed objective was 'to restore an independent, non-Communist South Korea to its pre-invasion territorial status'.¹⁹ Yet to avoid the risk of a world war, Truman limited the employment of American combat power to the Korean Peninsula. When Eisenhower came to power he was willing to remove the restraints imposed by Truman and even contemplated the use of atomic weapons against the Chinese in Manchuria.²⁰ Hence not only the selection of targets but also the selection of modes of attack and the weapons to be used may be regulated by grand strategic and strategic guidance.

The Enemy's Capacity to Wage War

An important determinant of the enemy's capacity to wage war is the combat effectiveness of his armed forces which depends on the military leadership and the quality and number of the fielded forces, including the effectiveness of their sustainment. Taking each of these

²⁰ *Ibid*, p 14.

¹⁹ Clodfelter, M., *Op cit*, p 13.

attributes in turn, ways of degrading the enemy's military capability may be derived.

Military Leadership. In a highly centralised command system, the leadership is an important centre of gravity. In such a situation, the effectiveness of the leadership may be simply degraded by eliminating the Saddam Hussein operated a highly centralised system of leader. leadership in the 1991 Gulf War, and despite repeated assertions by the US that Saddam was not a target, General Schwarzkopf has since admitted that 'at the very top of our [the Coalition's] target list were the bunkers where we knew he and his senior commanders were likely to be working'.²¹ As it turned out these attacks failed so that a back-up plan was needed. Where direct attack on the enemy leadership fails or has little chance of success, an alternative course is to attack the leader's capacity to command and control his forces. For effective command and control the leader needs information (intelligence) on which to base decisions, facilities to process this information for the purpose of decision making, and the means to communicate his decisions to his forces. By degrading any one of these functions of leadership, information gathering and processing, decision making and communication, the enemy leadership can be made ineffective. The simplest and most direct action can be to silence the leader and remove his ability to command forces by destroying the communications system. In the Gulf War, Saddam's communications system was a primary target.²²

Enemy Armed Forces. The enemy armed forces are, naturally, a centre of gravity. However, a direct engagement with these forces when they are operating at peak effectiveness carries a significant risk. There would be a higher chance of success and a reduced risk to friendly forces if significant engagement with the enemy is deferred until after the effectiveness of the enemy's forces has been degraded.²³ Several means are available for reducing enemy combat effectiveness. These means include degrading the enemy's air defences, logistics support, and ability to manoeuvre.

Air Defences. Destruction of the enemy's air defences (including aircraft, counter-air assets, and reconnaissance and surveillance facilities) creates an air environment in which friendly land, sea and

²² Loc cit.

²³ In the 1991 Gulf War, General Schwarzkopf required the air campaign to achieve a 50 percent attrition of enemy forces before the ground offensive would start.

²¹ Schwarzkopf, H.N., with Petre, P., *Op cit*, p 319.

air forces can operate without prohibitive interference by the enemy. In other words, friendly forces have an enhanced ability to manoeuvre because they are not threatened by enemy aircraft or counter-air forces. In such an environment friendly forces are free to attack the enemy's centres of gravity with relative impunity. The devastating effect on the enemy of inadequate air defences is evident in several of the Arab-Israeli encounters, particularly in the Yom Kippur War, the latter stages of the October 1973 War and in the Beka'a Valley air battle of 1982. The 1991 Gulf War is a more recent example.

Logistics Support. The function of logistics is to provide the resources for the forces to sustain operations at a necessary level and for the required duration. In doing so the logistics system operates maintenance facilities and facilities for the storage and movement of ordnance, fuel, spare parts, food, and other supplies. Each of these facilities including buildings, vehicles, sea-going vessels and aircraft, and the personnel manning them are enemy centres of gravity.

Ability to Manoeuvre. The ability to manoeuvre is an important determinant of combat effectiveness. This ability relies in part on the availability of transportation means and the capacity to manoeuvre without risk. Land transport systems may be interdicted as can airfields and seaports, or alternatively in the case of seaports blockade may be appropriate. Interdiction operations can also limit the enemy's ability to manoeuvre by making the risk to his forces too high or the cost of protecting them prohibitive.

Sustainment. In addition to sustainment operations carried out by the military, discussed earlier under the heading of logistics, civilian industry is an important contributor to force sustainment. Frequently, indigenous civilian industry is the source for ordnance and other essential war fighting materials. Important also are the key production facilities which provide the fuel and energy required by the enemy forces. Each of these are important centres of gravity which can affect the enemy's combat effectiveness.

The Enemy's Will to Wage War

Factors contributing to the enemy's will to wage war include:

National Leadership. The enemy's will to wage war also depends on the national leadership (as opposed to the military leadership). Where the national leadership is not cohesive and does not have the overwhelming

support of the populace, bringing the war to the people by attacking targets within the enemy's cities can work in either toppling the hostile leadership or convincing that leadership to order a cessation of hostilities. Targets would need to be ones which carry some national importance or significance. Striking targets which provide essential services to the population, for instance the power supply, could serve this purpose.

Popular Support. The level of popular support that the enemy has for maintaining hostilities can be an important determinant of the level of military commitment he is willing to make and of the duration of hostilities. President Nixon's decision to withdraw American forces from Vietnam was greatly influenced by the opposition of the American public to the war. The mass media, and in particular the electronic media, has a strong influence on public opinion. Where the media is a strong propaganda instrument working for the enemy in melding popular support for his actions, silencing the electronic media is one course open. Alternatively, where the media is able to disseminate news of the enemy's losses or foster a perception that the enemy's cause is not just, then it can work to lower the enemy public's morale and hence erode the public's support for the war.

National Economy. An extension of striking targets within the enemy's national boundaries could be an attack against key national industries which do not necessarily sustain the war effort but are important to the enemy's national economy. The threat against the national economy would be an important impetus for the enemy to cease hostilities. However, this raises complex legal issues which need to be addressed.

International Support/Alliances. Another factor affecting the enemy's will to wage war is international support or that of his allies. As Sun Tzu advises, disruption of the enemy's alliances and support base may influence the enemy's decision to continue the conflict. Alliances are important not only because they can provide moral support but also because their support can take a more material form which can help the enemy sustain the war effort, for example weapons and ordnance. Saddam recognised the importance of the Arab support for the US during the 1991 Gulf War and attempted to disrupt the alliance by enticing Israel to take the offensive. Militarily, alliances could be disrupted through direct attack, as tried by Saddam, or the threat of attack including a possible show of intent.

Operational Failures. Finally, there will be nothing more convincing to force the enemy to abandon hostilities than the imposition of operational failures and the significant degradation of his war fighting effort. The

targets for this effect are predominantly military ones including the enemy's armed forces and their logistical support base.

The Warden Model

One model proposed to aid target selection is that put forward by Colonel John Warden, USAF.²⁴ Warden proposes a model, illustrated in Figure 1, comprising five concentric rings representing the enemy's centres of gravity, with the inner ring representing the most important centre of gravity. According to this model, when attack of the enemy command is not feasible, 'it is possible to render the enemy impotent by destroying one or more of the outer strategic rings or centres of gravity'.²⁵ Importantly, Warden stresses that,

'all actions are aimed at the mind of the enemy command. Thus, one does not conduct an attack against industry or infrastructure because of the effect it might or might not have on fielded forces. Rather, one undertakes such an attack for its effect on national leaders and commanders who must assess the cost of rebuilding, the effect on the state's economic position in the postwar period, the internal political effect on their own survival, and on the cost versus the potential gain from continuing the war.²⁶

The fourth ring in Warden's model may appear to condone the targeting of non-combatant civilian populations which is contrary to the law of armed conflict (LOAC). To eliminate any possibility of misconception, it should be stressed that *targeting* does not automatically infer the use of lethal weapons. Non-lethal methods such as psychological operations may legitimately be used to *target* the enemy population. The use of leaflet drops and media broadcasts are well known methods of *targeting* civilian populations. Other methods have also been used to disrupt the orderly function of enemy society through the conversion of key personnel to one's own cause and through them the incitement of parts of the enemy society to rebel against their leadership are also non-destructive means of *targeting* the enemy population. Hence, the fourth

²⁶ *Ibid*, p 68.

²⁴ Warden, J.A., 'Employing Air Power in the Twenty-first Century', in Shultz, R.H. and Pfaltzgraff, R.L., *Op cit*, pp 64-65.

²⁵ *Ibid*, p 65.

ring in Warden's model is a legitimate centre of gravity that should not be ignored.



The Warden model is a clear statement of enemy centres of gravity and provides a logical foundation on which to base the planning of offensive operations by all combat arms - in a *traditional war* such as that between developed nation states. A problem arises, however, when the war does not fit the traditional mould. For example Warden's model would have had limited application in the Korean and Vietnam Wars where the enemy leadership was not centralised and where the enemy homeland did not have a developed industrial base on which depended the sustainment of the war effort. The bungled Operation STRANGLE II has also shown that attacking the transportation network can be ineffective when the enemy is not reliant on established transportation systems.

Application of Warden's Model

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Hence, while Warden's model provides a valuable starting point, there is more to the art of targeting than attacking the five key centres of gravity identified in the model. This is particularly true where particular centres of gravity are not open to attack. Such situations include the following:

Limited Combat Forces. When the combat forces available for the task are limited in size and capability, the capacity to achieve the requisite critical mass in attacking the centres of gravity may become a serious constraint. In such a circumstance the prioritising and phasing of operations, and the need to ensure economy of effort become primary concerns.

Absent Centres of Gravity. Warden's model has little utility in situations where the several centres of gravity identified in the model are either not present or are not genuine centres of gravity in that they do not contribute to the enemy's will and capacity to wage war. Such a situation arose in the Korean and Vietnam Wars where there was no significant enemy industrial base and the transportation systems, such as the rail networks, were not essential to the enemy's war effort. Moreover, the enemy leadership was not centralised and readily open to attack.

Limited War. Warden's model has little application where political constraints make some of the centres of gravity not open to attack and where there is a desire to avoid escalation of hostilities. In such circumstances attacking the enemy's leadership, industrial and transportation infrastructure or the enemy's population would be inappropriate.

Need for Caution in the Use of Air Power²⁷

The reach, rapid concentration of force, and the potential for air power to strike deep into the enemy's homeland, either with precision or to bring indiscriminate destruction, highlights a fundamental difference between air strikes and surface strikes (excluding those by surface to surface missiles). This attribute while making the air strike a potent

²⁷ The author acknowledges the significant contribution of Drs Alan Stephens and John Mordike to this discussion.

application of combat power makes it also one liable to misuse and/or misdirection.

A study of Bomber Command strikes against Germany in World War II suggests that the control of air strike operations should be subjected to very high level military supervision, possibly the highest.²⁸ The purpose of such supervision would be not only to ensure the efficient and effective use of air power, but also to assure that the targets attacked fall within strategic guidelines. During World War II, the strategic objective given to Allied bomber commanders, Air Marshal Harris and General Eaker, was to achieve the

'progressive destruction and dislocation of the German military, industrial and economic system, and the undermining of the morale of the German people to a point where their capacity for armed resistance ... [was] ... fatally weakened'.²⁹

Air Marshal Harris was able to interpret that directive to suit his own theories, which meant he continued to target German cities and civilians. However, at the Casablanca Conference of January 1943 the enemy centres of gravity were identified by the Combined Chiefs of Staff as (in priority order): the submarine bases and yards, the German Air Force and its factories and depots, ball bearings, oil, synthetic rubber tyres, and military transport.

Therefore, it would seem to be necessary for the targeting process to be controlled at the highest levels to ensure that the operational focus is not shifted from that required by strategic guidance. Arguably, this applies more to the application of air power than to other forms of combat power. The reason for this is that, with the exception of surface launched missiles and special forces, air power is the only combat force that has the reach to strike enemy strategic targets which comprise the four inner rings of the Warden centre of gravity model.³⁰

The issue remains; at how high a level should control of the targeting process be fixed. During Operation ROLLING THUNDER of the Vietnam War, the targeting process was controlled by the United States

²⁸ Unpublished correspondence from Dr Alan Stephens held by the author.

²⁹ Hastings, M., Bomber Command, London, 1987, p 185.

³⁰ The author thanks Dr John Mordike for drawing attention to the capacity of special forces to attack the strategic targets identified by the Warden model.

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National Security Authority comprising the President and the Secretary of Defence, who met with their advisers at President Johnson's now notorious Tuesday luncheons.³¹ Significantly, the group of presidential advisers normally excluded the Chairman of the Joint Chiefs of Staff so that there was limited direct military input into the target selection process.

The targeting process was unsatisfactory because of the absence of military input and the interruptions caused as a result of the President's preoccupation with other matters, such as the attempted coup in the Dominican Republic at the end of April 1965 and the Arab-Israeli War in June 1967. The President's absences for health reasons also interfered with the targeting process. Moreover, the quality of the targeting directives was also suspect, often leaving the military confused and uncertain as to what was intended.

The general failure of the targeting process employed by the United States for ROLLING THUNDER would seem to argue that responsibility for the targeting process should be vested in the highest *military* leadership who would select targets in accordance with politically endorsed strategic guidance. Military leaders' attention is less likely to be distracted by external matters and their knowledge of operations would ensure clearly understood guidance is provided to the combat forces.

Targeting - An Australian Perspective

Although the target selection process stems from a centre of gravity analysis, potential targets must be put though several filters before they are selected for attack. These filters will test each potential target to determine whether it is viable in terms of constraints imposed by strategic guidance, the Law of Armed Conflict, force capability and force employment principles.

During the 1991 Gulf War, the Coalition forces, through sheer weight of available resources and because of the nature of weapons and ordnance in their inventories, were able to attack continually and concurrently all of Iraq's centres of gravity. This included targeting the population using psychological operations in the form of leaflet drops and

³¹ For a detailed account of the targeting process employed by President Johnson see Clodfelter, M., *Op cit*, pp 120-122.

radio and television broadcasts.³² However, the ADF being a much smaller force with a more limited range of weapons and ordnance would be forced to set more stringent priorities for the allocation of effort.



Several considerations would have a bearing on which targets were to be struck and which force elements to task. Indeed, the possibility of tasking alternative elements of combat power must also be considered. The substitution of one form of combat power for another has long been the subject of debate (both on the basis of logical argument and self-interest) by services the world over. While discussion of this issue is beyond the scope of the present paper, it would be remiss to ignore the need for such a consideration to be made in the interest of maximising the effectiveness and efficiency of national combat forces.

Each target and force element option must then be tested against each of the following factors.

Strategic Guidance. The starting point is the grand strategic and strategic objectives. These will define the bounds of authorised actions

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Putney, D.T., 'From INSTANT THUNDER to DESERT STORM: Developing the Gulf War Air Campaign's Phases', *Air Power History*, Fall 1994, pp 39-50.

and the limitations placed on the nature of targets authorised for attack. The grand strategic and strategic objectives will also define the required time within which the objectives must be achieved, the desired end-state after the war and, hence, the effect that needs to be created on the enemy. Strategic guidance will also include requirements with respect to LOAC and Rules of Engagement (ROE) compliance. Given the strategic guidance the operational commander and his battle staff can then identify the target options available for attack and those not available for attack and he can also identify any force elements debarred by strategic guidance from taking part in the operation.

Target Set Selection. Once the centres of gravity available for attack have been established, the selection of the ones to be targeted is based on the following considerations:

Support of Strategic Objectives. The first point that must be considered is the degree to which attacking the potential target supports the strategic objective. If attacking the proposed target is only going to have a marginal effect on the overall outcome of the campaign then consideration must be given to identifying higher priority targets.

Effect on the Enemy. There must be a valid analysis of the effect that attacking the proposed target will have on the enemy; that is both the direct impact of the attack and how this will influence the enemy's will and capacity to wage war including the time over which these effects are expected to be felt by the enemy. In addition, the analysis must also include assessment of the enemy's capacity to mitigate the effects of the attack and hence defeat the purpose of attacking the proposed target. Such an analysis would have shown that the Operation STRANGLE II rail interdiction campaign was an ineffectual operation.

LOAC and ROE Considerations. Australia has many international treaty obligations which require compliance with the Law of Armed Conflict. Consequently, targets must be assessed to determine if there will be any LOAC violation. Similarly, potential targets must not contravene the ROE approved by the government. Although, if deemed necessary, ROE changes may be requested.

Achievability. Naturally the intent of attack is to achieve some effect at the target. The probability that the desired effect will be generated must be assessed before a potential target is approved. Factors
determining the achievability of the desired effect at the targets include:

Suitable Weapon/Ordnance. The inventory must be examined to determine whether or not suitable delivery platforms and appropriate ordnance exists to give a high degree of assurance of achieving the desired effect at the target, given the constraints imposed by strategic guidance. In considering the suitability of available weapons and ordnance, planners need to be satisfied that the weapons-ordnance combination proposed for use provides a cost-effective means of attacking the proposed target. For instance, the number of sorties required to ensure an acceptable level of success and the risk to the tasked force element need to be balanced against the importance of attacking the target.

Trained Aircrew. Depending on the proposed mission profile, a determination needs to be made that adequately prepared aircrew are available or that there is adequate time for preparatory training and rehearsal.

Target Accessibility. The accessibility for attack of the potential target needs to be established. For example, it would be pointless to identify a target beyond the reach of available forces. The suitability of the prevailing weather and the level of protection afforded to the target will also be considerations here. For example highly fortified targets may not be susceptible to attack with available weapons and ordnance.

Currency/Accuracy of Intelligence. The adequacy of available intelligence on the potential target needs to be established. For instance, the currency and accuracy of intelligence will be prime considerations where mobile targets are contemplated for attack.

Measure of Success. An important element of the achievability of a target is to have a statement of what constitutes success. This is to enable an assessment to be made of the success of the mission and to determine subsequently if the outcome of the attack did indeed have the expected effect on the enemy. Without such a yardstick or the means to make an assessment, attacking the target could be a futile exercise.

Weight of Effort Required. Depending on the other commitments of forces and the need for an appropriate balance between prosecuting offensive and defensive operations, the relative priority of each

potential target needs to be assessed based on a determination of the weight of effort required to be launched and the expected end effect. For well-fortified targets, repeated attacks may be necessary to ensure success. Alternatively, the attacking force may need to be accompanied by other elements to suppress enemy air defences, provide air-to-air refuelling, early warning and jamming of enemy target acquisition and tracking systems. Depending on the target, the force package required to defeat it could comprise a significant part of available resources. Therefore, the relative priority of each target versus the weight of effort required needs to be carefully considered.

Risk to Own Forces. Another consideration that needs to be made is to determine the level of risk to which the tasked forces will be subjected. There is a need to ensure that the potential cost is adequately compensated by the expected benefit of conducting the attack.

Enemy's Response. The final step is to assess the enemy's reaction to the attack. The courses of action open to the enemy must be evaluated and his most likely course should be determined, whether this be a retaliatory action or a change of strategy. This will assist in further validating the targets selected and in retaining the initiative of manoeuvre.

Once the above steps have been completed for each of the potential targets, the selection of targets for attack, the prioritisation of these targets and the phasing of operations should be made. This would be based on selecting those which will make the greatest contribution towards achieving the strategic objective, with the most effective use of forces and the lowest risk of failure and loss.

The target selection process is a key determinant of success in war. Poor target selection can lead to a failure to achieve the strategic aim, dissipation of war fighting resources or at the very least protraction of the war. While the logic behind the centre of gravity approach to target selection is sound, difficulties can arise in warfare where the enemy is not a developed nation having centres of gravity such as key production facilities and communications and transportation systems that are essential to its war fighting effort.

Equally, difficulties arise when the enemy's centres of gravity as discussed by the military theorists and depicted by the Warden model, are excluded from attack by strategic guidance and authorised ROE.

An Australian Perspective on Targeting

Moreover, where the available war-making resources are limited in either number or capacity, knowing the centres of gravity does not necessarily make them open to attack. Hence, there is a need for a process for assessing and comparing the relative merits of targets which are open to attack. Such a process which can be used to provide a basis for target selection and prioritisation has been proposed which will assist in the production of an executable target list.

CHAPTER THIRTEEN

SOME CLOSING THOUGHTS

'Land, sea, air, and space were all sub-elements of the overall campaign; there was no room for prima donnas. You need people schooled in their own type of warfare, and then you need trust in each other.

> LT GEN Charles A. Horner Commander CENTAF during DESERT STORM^{'1}

'In modern warfare, any single system is easy to overcome; combinations of systems, with each protecting weak points in others and exposing enemy weak points to be exploited by other systems, make for an effective fighting force.

> VADM Stanley R. Arthur Commander NAVCENT during DESERT STORM'²

Through planning and directing campaigns, the operational commander provides a mechanism for integrating and harmonising land, sea and air operations. The most significant aspect of these operations is that individual actions in each of the separate environments form part of are inter-related. That is, together they form the joint campaign. This does *not* mean that the character of warfare in each of these environments must undergo fundamental change. However, it *does* mean that all such operations need to have a common purpose and be set within a common framework of priorities. This point has some far-reaching implications affecting most aspects of the establishment, employment and support of combat forces including:

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Horner, C.A (Lt Gen) quoted in Joint Pub 1, Joint Warfare of the US Armed Services, 11 November 1991, p 69.

Arthur, S.R (VADM) and Pokrant, M., 'The Storm at Sea', US Naval Institute Proceedings 117 (May 1991), p 87.

Doctrine. Coherent, unambiguous, validated joint doctrine is needed for effective joint force employment. At the operational level this doctrine should be supported by procedures for the designation of responsibilities, the establishment of command relationships, and the assignment of forces. While single service doctrine and standard operating procedures are developed individually by each service, they should be consistent with joint doctrine. For air power employment, the existence of valid joint doctrine is of particular importance. In past conflicts, doctrinal inconsistencies relating to the employment of air power has caused friction within joint forces and degraded the effectiveness of operations.

World War II, the Korean and Vietnam Wars, and more recent conflicts, such as the Gulf War, instruct that joint doctrine should formalise the principle of centralised control for air power. With this principle should come an understanding of the importance of *mutual support* between air and surface forces. Hence, above all joint doctrine should be flexible. Rather than enshrining the pre-eminence of one service or another, joint doctrine should allow for each form of combat power to take a leading role as circumstances demand. Thus at different stages of the conflict land, sea and air commanders may act in support of other forces or be supported by them.

Force Structure. Force structure should facilitate cooperation within joint forces. For this to be possible combat elements comprising joint forces need to be interoperable. Interoperability is particularly crucial in communications and information systems. This is not to imply that the services should have identical communications and information systems. On the contrary, it is particularly important for effective operations that each service has communications and information systems need to be compatible facilitating communications and information transfer between all force elements and between the latter and the joint force headquarters. Despite the technologically advanced communications systems available to American forces, effective dissemination of the CINC's directives and the JFACC's air tasking orders was impeded by incompatible communications systems. This caused delays, confusion and generally compounded the friction in war.

There is also a need for the weapons systems operated by the various services to be complementary. Beyond the need for compatible, secure communications and IFF systems, there is also a need for such weapons systems to provide combat capabilities which can be formed into effective force packages. Operational performance and operating envelopes need to be such as to enable various force elements to combine cooperatively. Under the present arrangements, it is difficult to achieve a high degree of complementarity, compatibility and interoperability. Each service defines its operational requirements and manages its capital acquisitions independently of the others. Moreover, major procurement proposals made by the various services are considered *in competition* by the higher defence committees. It is difficult in this situation to achieve the requisite level of cooperation that is envisaged.

It could be argued that HQADF Development Division (Dev Div) and the Force Development and Analysis Division (FDA) provide a mechanism for the development of joint capabilities. However, the present force development process suffers for two reasons; Dev Div is divided into land, sea and air organisations perpetuating the segregation of the three environments, and FDA is too far removed from the actual conduct of war to be in a position to provide the operational perspective. In recent times a Director General (Joint) organisation has been created in Dev Div providing some joint focus. Even so, the interaction between desk officers in the land, sea and air organisations of Dev Div is not formalised and is dependent on the inclinations of individual officers.

Input from an operational commander would improve the force development process by providing the joint operations perspective. The perspective of a combatant joint commander whose focus is on the conduct of operations would make an invaluable contribution to the debate over essential versus desirable capabilities and complementary versus alternative capabilities.

Command and Control. The command and control structure needs to be coherent and unambiguous. It also needs to be supported by redundant, secure and survivable command and control systems which are widely accessible. In modern warfare, the leadership function is a Often, physically attacking the leaders primary centre of gravity. themselves is difficult. In such a situation, degrading the leaders' capacity to command and communicate with the fielded forces becomes a primary objective. This may be done in two ways; either physically destroying or degrading C⁴I systems, or causing disarray in the enemy's command and control process. A high tempo of operations has the potential to cause a break-down in the enemy's decision processes. Alternatively, operations which exploit weaknesses in the command and control structure or which cause friction between senior commanders may have the same effect. Hence, the command and control arrangements that are created and the C⁴I systems which support the command decision process need to be robust under that form of attack. The only way to validate the robustness of the command and control arrangements, and the leadership support systems is to test them under stressed conditions, such as major exercises.

Intelligence. Intelligence is a vital input into campaign planning at all levels through the potential it offers of dispelling the fog of war. However, as in the Vietnam war, the lack of a coherent intelligence picture can be a cause of friction. For effective joint operations, the intelligence available to all levels of command and all component forces needs to support the same interpretation of events. In the Vietnam War a multiplicity of intelligence agencies provided often conflicting assessments which were the source of friction between senior commanders. A joint intelligence agency providing intelligence assessments to the joint force commander and all the component commanders would avoid that problem.

The intelligence picture needs to support theatre level warfare. The operational commander's perspective is one of campaign outcomes. This requires intelligence assessments to interpret individual events, such as: BDA inflicted upon the enemy and that suffered by the friendly forces; enemy and own rate of effort; and other intelligence data. The objective should be to provide an assessment of the degree to which the campaign has progressed towards the strategic objectives. Intelligence assessments should also give guidance on the appropriateness, preferred timing and likely success of planned future actions. For intelligence agencies to be able to make these assessments, they would need to have a suitable scheme of monitoring campaign outcomes. Part of the intelligence planning process, before hostilities begin, should be to establish such a monitoring scheme, identify the intelligence data required to support it and put in place means for collecting it. For such a scheme to be developed, intelligence agencies would need to have a clear understanding of the operational commander's concept and intent. They would also need to be familiar with the commander's own thinking process in relation to the interpretation of the campaign outcomes.

It could be argued that the role of intelligence agencies should be to provide the information for the commander to make his own interpretations and assessments. That is certainly the commander's prerogative. Intelligence agencies, though, have access to a large amount of detailed data that the commander does not necessarily see except in summarised form. Empowering intelligence agencies to interpret campaign outcomes, in the sense discussed previously, would ensure that all this data is considered for relevance to campaign outcome monitoring. Moreover, intelligence agencies would be in a better position to identify the data requirements and establish appropriate data collection. Effective intelligence would enable an effective and efficient use of available combat resources. Efficient use of air power is vital for a medium power such as Australia which has a vast area to defend.

Exercising. Peacetime exercises are designed to hone professional and combat skills, and to validate doctrine and procedures. Major high level joint exercises are expensive undertakings and consequently are rare events. Therefore, the tendency in peacetime is to concentrate on tactical training, even though a significant proportion of such training is joint. Within the ADF there is an awareness that operational level training and exercises are a vital part of preparing for combat. This was evident in the attempt to use Exercise PITCHBLACK'94 to exercise air campaign However, the problem with utilising what is essentially a planning. tactical training event to exercise operational level warfare is that it limits the freedom available at the operational level to plan activities. The tactical training requirement of providing a given number of specific missions to aircrew within restricted flying windows to a large extent predetermines the flying program. Hence, the operational level has very little scope to plan. One way of overcoming this problem is to develop a series of CPXs designed to exercise the operational level without the cost of a full-blown joint exercise and without the restriction of tactical training exercises. At least some of these CPXs should be joint, to ensure that joint doctrine and procedures as well as joint warfare command and control arrangements are tested.

Under the weight of everyday pressures there is a strong tendency to delegate to subordinate headquarters staff the task of participating in exercises. Hence in PITCHBLACK'94 Air Headquarters staff at the rank of Squadron Leader and Wing Commander were participating in the Battle Staff and Battle Management Group activities.³ While the practice of giving subordinates this type of experience is laudatory, care should be taken to ensure that the senior officers who would carry the responsibility in war also exercise that responsibility in peacetime.

Logistics. Because the emphasis in existing ADF exercises is on tactical level training, the logistics system is rarely tested under operational conditions. Logistics requirements for the annual exercise program are worked out months in advance and logistics materiel is pre-positioned for each exercise. Hence, the endurance and sustainability of the ADF is rarely, if ever, tested in peacetime operations. There is a need to establish the nexus between operational sustainability and logistics capability. This

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Squadron Leader and Wing Commander equate to Major and Lieutenant Colonel, respectively.

may be done through logistics capability modeling techniques or through creating CPXs designed to test the logistics system.

Research and Development. Australian defence equipment is predominantly procured overseas. Consequently, there is a strong tendency to focus on equipment procurement rather than on capability generation. The potential to utilise defence scientific agencies such as DSTO to formulate capability requirements for the ADF is not fully exploited. Frequently, equipment procured overseas also needs to be adapted to Australian environmental conditions and to our own particular requirements. It is incumbent on the ADF and DSTO to have a program of critical defence technologies in which to maintain expertise. Such a program would ensure that the ADF is well placed in assessing future capability requirements versus available technologies, and in evaluating candidate equipment for filling those capabilities. At the present time each of the three services deals independently with DSTO and other scientific agencies. The potential to develop interoperable or complementary capabilities bridging the service boundaries is, therefore, not high. The office of the Chief Defence Scientist, HQADF Development Division, and the Force Development and Analysis Division provide a mechanism for the development of joint capabilities. However, the present force development process suffers because the organisations involved are too far removed from the conduct of war. Input from an operational commander would improve the force development process by providing the joint operations perspective. Essential and desirable capabilities would be identified from the perspective of a combatant joint commander whose focus is on the conduct of operations. It can be argued that this type of input is currently lacking.

CJFA - A Role for an Operational Commander in Peacetime

In establishing CJFA as a non-permanent appointment which is activated only for operations, the ADF has forgone the opportunity to use peacetime activities to forge a true joint force. At present there are inadequate means of developing more jointness into the ADF because there is a lack of focus at the operational level. Doctrine formulation, force structure, command and control arrangements, intelligence, exercises, logistics, and research and development are all activities which are carried out along essentially single service lines. The tri-service outcome is all too often an amalgam of the individual service positions. Thus, the originating and main focus is not at the operational level.

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Permanently manning the CJFA position would redress that situation. The concern with investing a high level of authority in a single operational commander would be that the integrity of the three services as separate entities may be lost. A more cynical concern may be that that commander would carry into his appointment the biases associated with his parent service and that he would favour that service over the others. To avoid such a problem efforts should be made to ensure that the CDF, VCDF and CJFA appointees each originate from a separate service. Also, given that the function of an operational commander is to mould three distinct services into a joint force, the selected CJFA should be an officer of broad experience and balanced outlook.

The focus at the operational level of war that a permanent operational commander would bring is an important one for Australian air power. In operations air power is a much sought after scarce resource that needs to be carefully applied. Given its ability to act across the depth and breadth of the battlefield, the most judicious use of air power is possible only when it is viewed as a centrally controlled theatre resource. This perspective is important when new capital acquisitions are under consideration. Air power capabilities are expensive to acquire and maintain. Hence, proposals for such acquisitions are frequently challenged at a time of limited defence outlays. An operational level view of air power will give due importance and relevance to those capabilities within the ADF force structure.

APPENDIX 1

AN AIR COMMANDER'S EXPERIENCE

This interview with the then Air Commodore, D.N. Rogers, Commander Strike/Reconnaissance Group was conducted on 12 September 1994.¹ The subject matter relates to the Air Commodore's experience as Orange Force Air Component Commander during Exercise PITCHBLACK'94. Rather than being a structured account of the Exercise, this interview is a free-ranging discussion of some key issues.

[TRAMOUNDANIS] Sir, RAAF doctrine for air campaign planning at the operational level does not exist, but it is an area that the RAAF has started to look at more carefully in recent times. I'd like to contribute to this process of doctrine formulation through the work on my fellowship. To that end I am working on a monograph that examines the role and function of operational level command and in particular command of air assets. I am examining past experience and lessons learnt and evaluating their relevance to the RAAF with a view to recommending a planning framework that would suit our operations.

I am, therefore, very interested in Air Command's recent attempt at air campaign planning during Exercise PITCHBLACK'94. Could you please describe for me the set up for PITCHBLACK'94 and in particular the air campaign planning processes developed during the exercise.

[ROGERS] As you said, in exercising the levels of campaign planning, we've never really done them properly. What we've done in the past, if we use PITCHBLACK as the example, is set up the headquarters in Darwin or Tindal or Curtin. For this type of scenario, we deploy, in my case 82WG. The Orange Air Commander has been traditionally OC82WG, or someone with strike type experience. I've done it before in PITCHBLACK when I

Since the date of this interview, the now Air Vice Marshal D.N. Rogers was posted on promotion to Deputy Chief of the Air Staff.

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was at Richmond and Dave Dunlop has done it before and so has Peter Criss.² This year, as you're saving with your fellowship, we really had to separate the operational level planning and the tactical level planning, so we tackled it a different way. The Air Commander wanted it structured this way. In essence, I deployed the wing as we would do in any similar conflict at this level and in this case we deployed to Curtin. But we had 82WG HQ in Darwin. 1SQN went to Curtin, with a mix of 6SQN for the recce side, and I and my headquarters staff moved to Air Command to set up the nucleus of the Battle Staff. I took with me my Staff Officer Plans and Policy (SOPP), a Wing Commander, and my Staff Officer Photographic Recce Policy and Plans (PRPP), a Squadron Leader who is a PHOTO officer but he's my expert in recce work, and I took a Flying Officer down with me who is my Plans and Policy 1 (PP1). I had another Flying Officer in the headquarters, the Aircraft Manuals Officer (AMO), he really doesn't get involved in operations but as the young fellow had just done a weapons course down at Sale and neither he nor PP1 are F111 trained. I sent him with 82WG HQ to Darwin to get a little bit of experience.

So HQ SRG moved to Air Command to set up the Battle Staff system. What we had in mind, in terms of our doctrinal thinking, was to run the campaign from Air Command as a strike campaign. Not air defence; air defence was the other side of the house.³ The idea was to set up a strike Battle Staff to go through the initial planning phases and fighter group would be involved at a later stage. We aimed to develop some form of planning mechanism at Air Command where we would consider the relevant factors and produce an instrument which we could put out to the tactical level on a daily basis having considered all the inputs from the higher level, the intelligence functions, and also having done a lot of the target analysis. We could put together this instrument and pass it to the wing from which they would generate the tasking orders. What we came up with was an Air Tasking Directive, the ATD.

The development of the ATD was an interesting thing in itself. We had to decide what we needed to put in it and how much detail to include. So we came back to square one and we looked at it from a philosophical point of view saying, 'Where are we at the operational level? What do we have to say?' We decided in simple terms we had to tell them [82WG] the 'what'. The Air Commander was given his strategic guidance as to how he was to

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Group Captains Dunlop and Criss. The former is the current OC82WG and the latter is a past incumbent of that position.

Tactical Fighter Group formed the Blue Force Air Component conducting air defence operations against Orange Force.

prosecute the campaign with Blue Land. Remember, while I was using our doctrine, I was also playing the enemy.

[TRAMOUNDANIS] Yes.

[ROGERS] We had our guidelines and our objectives. So what we had determined at the outset of our operational planning was to look at all the factors and come up with the 'what'. And then we put down the 'what' in this document and dispatched it to the people at the tactical level. Incidentally, the deployed wing had use of all the assets of the Singaporeans so it was very much a combined operation. OC82WG then had to determine the 'how'. So we didn't tell him how to do the job, we told him what we wanted him to do and we deliberately withdrew quite a lot of the information and tried to avoid any duplication of effort between what we did and what they did. Of necessity, there was some overlapping work but we didn't put that into the instrument that we passed down. You'll hear from Group Captain Dunlop what he got in the ATD and how he used it to do his job.

So, at Air Command we ran the Battle Staff. I don't think there had been a clear expectation of the level of play that would be necessary at the operational level and how the AHQ staff had to be involved. Very few of the people at Air Command had ever been involved in Battle Staff activities. The Air Commander and the Chief of Operations had been involved in it, but none of the Group Captains and very few of the Wing Commanders, mainly as a result of the normal posting cycle.

In the Battle Staff room we had all of the required communications. All those things had been pre-arranged for the exercise. We had communications with the respective bases, we had video links, we had ASMA which is very rudimentary, but it gave us the means to transmit information, data and orders both up and down the command chain when necessary.

[TRAMOUNDANIS] ASMA?

[ROGERS] The Air Staff Management Aid. It's the information system with which we communicate orders and store/retrieve data involved in operations and the associated logistic support. We had ASMA but we needed a back-up, as we didn't have secure communications to Curtin. In this case, we used secure fax. I'll tell you a little bit about transmission details later on, but one thing you have to have is several levels of redundancy in your communications to assure your ability to pass messages. We also set up the overhead video projector, using PowerPoint for developing the graphics. Somebody was very skilled on that being able to manipulate the information very quickly. AHQ also had MOSAIX which was in very primitive form, you may have seen it. I think it has a lot of promise but we're really starting from square one. We would be better, I think, having a look at the American CTAPS system as we did in Guam earlier this year and developing an offshoot of that, one which is compatible with our allies.⁴ I think we are really only scratching the surface with MOSAIX. It has promise but it means that we are starting five years behind the rest of the world and we may never catch up at our rate. They go ahead in leaps and bounds and we go ahead at a snail's pace. That's one thing we've got to be really careful of, and you've got to have all the infrastructure set up, ready to go.

In the Battle Staff room you've got to have a functional layout. In this regard I was reasonably critical. AHQ has these mobile coffee tables which you can put into any shape or form. Now I appreciate the problems of setting up a headquarters to run a Battle Staff are complicated by the prospect we now face of the collocated Joint Headquarters and we have to watch the level of investment. I can appreciate that problem, nevertheless we did the best we could with what we had.

My ideas about how the Battle Staff room should be laid out are different from those of other commanders. In my view each commander should be sitting in there with his communications, computer, and ASMA terminal. The Air Commander should have video links straight in front of him, he shouldn't have to get up and walk over to other areas to use phones or other facilities. We have a bit more thinking to do in this area.

In setting up the Battle Staff itself I spoke with the Air Commander. I told him, 'I will run it and I'd like you to come in and have a look, and one day you run it to get an idea of what we're considering'. As to the constitution of the Battle Staff, I had my specialist Strike people, SOPP and the reconnaissance specialist as well. As I don't have any intelligence personnel on my staff, I had the SOINT, Wing Commander O'Brien, then as the Battle Staff XO, Group Captain Mike Nixon. Really that was the core of the Battle Staff. I also had some people who were providing information. We also used the Air Command target intelligence people. There was an American Major and he had three or four Sergeants. He'd brought them up for the experience which I think was very sensible

⁴ Contingency TACS Automated Planning System (CTAPS). TACS stands for Theatre Air Control System. CTAPS is a powerful, computer system architecture that adheres to joint standards. It is used by the USAF to prepare Air Tasking Orders.

because they all benefited considerably. I also involved representatives from all the Air Headquarters Branches as is the normal Battle Staff procedure. This time, because the Group Captains were busy, we did it at the level of Wing Commander and Squadron Leader. At least we're sowing the seeds and making a future investment with people at those ranks. I think they too gained a lot from their involvement.

We had to look at all aspects and take all the factors into account, such as the logistics, and our airfield capabilities. Also public relations, which had, to a degree been overlooked, but which are a responsibility that you've got to consider at this level. I don't mean running a public relations campaign, but looking at the implications that our actions may have on public perceptions.

[TRAMOUNDANIS] Legal?

[ROGERS] Legal played a very big part. Unfortunately Wing Commander Wise was away on a coroner's inquest, but I got a Flight Lieutenant over from Adelaide who was very good. She had never been involved in such activities before and we threw her into the deep end, books and all. Her response and advice was superb as she played an important part on several of the committees.

I set up the Target Selection Board, the TSB, you can give it whatever name you like. I wanted this group of people to go through all the detail and select the targets which would achieve the outcome I had stated. It was run by my Wing Commander⁵ and he had the intelligence people, the American targeteer, some of the Sergeants who would do the leg work and all the target/weapon analysis. The photographic-reconnaissance officer⁶ sat on the TSB as well. Not only did they actually have to select the targets but they had to determine whether attacking them was practical and within our aircraft/weapons' capabilities.

We had a schedule, every morning at 0900 hours I ran the first Battle Staff meeting. We tried to have the Battle Staff over in about an hour. We would go through, simple things first. We had to get a good idea of what the weather was like in the area, a forecast of three days. The three days will come into context when I get onto the ATD. So, we went through the weather, we went through the current intelligence, building up to what

SOPP.

PRPP.

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had happened the day before so we could develop an understanding of what was going on. Then we went through the current Rules of Engagement that had been handed down to us. We went through the objectives of what we had to do. Then we ran through the development of the ATD for that day. We had slides showing where the targets were. Then we had to see if there were any logistics problems, any public relations problems, any legal problems, any medical problems, evacuations, etc. All these things had to be considered before formulating the ATD that would be passed to the tactical commander.

[TRAMOUNDANIS] How did the Battle Management Group fit in with that process?

[ROGERS] OK, the BMG is coming into it now. Once we had the Battle Staff meeting which would last for about an hour, I used to clear the room of all the headquarters people and then we would get down to the BMG. Now the BMG was run by Group Captain Nixon, the Battle Staff XO. He would get together all the specialists and because it was a developing concept, I sat and listened but did not take part in their activities.

They would go through the whole thing looking at the objectives and saving, 'Here's the area of operations, here are the objectives, these are the assets we've got, these are the capabilities that we've got, how do we achieve the best result?' In PITCHBLACK, unfortunately, we didn't get all the assets, as you know, with the F/A-18s of the US Marine Corps dropping out. So we had a different ball game. The original intention was to see how we could have a go at this air defence system. But it changed overnight and we had to adopt another tactic. We had to look in this case at the rules of the exercise and the rules of the game. Really. that replicates anything that can happen in real life. Things can change overnight and you've got to go back to square one. We had a look at his [the enemy's] air defence system; we identified where his key points were, where his weaknesses were and his centres of gravity. We went through all that thinking process in the BMG and we decided where his air fields were and what his likely movements would be as far as support was concerned. We had a look at the rules; if you knocked out something how quickly was it regenerated, or how quickly was it replaced. We had a look at all the nodes of communications, how the information flowed, whether it was by microwave, whether it was land line, whether it was by satellite or whether it was by fibre-optic cable. We identified a lot of weak points and things like that. We said, in this case, we can't gain any air superiority because we don't have the capability, but what we have to do is try to pick the eyes out of his system, to degrade it to the extent where we could achieve our secondary aim. This was to isolate this area over near Wyndham so that the next phase of the operation could start. That

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was our whole drive initially with shifting a little bit towards the west. So we had virtually a three-phase campaign. One phase was to degrade his [the enemy's] system and then to slowly carry out interdiction towards the west in readiness for the last phase [a ground offensive]. We had to look at things like what were his reserve forces, where they were. We had to anticipate when he would be moving forces forward, what he would do with them, where would they go, all that level of detail.

The BMG came up with the battle plan which we decided would have to cover about ten days. It was a first cut of what we had to do. Ideally in an air defence system, if you took out the aircraft, the airfields and the radars you might be in a pretty good position. But in this case we found that if we went for the airfields they could be repaired within four hours. That would have been wasted effort, as we would have to do it time and time again and our loss rates would have been high because he certainly had the upper hand. If we went for the aeroplanes on the ground he had the ability to regenerate them. That would have been wasted effort too. So we decided to look at the other parts of the air defence system. They included not only communications but also the radars. So we located the radars. We worked out we'd need some recce work to identify them because there were five or six sites. We had to go through that thinking process to select the targets. We said, 'Right, if we take out the radars that gives about a week and more time to go after other things'. Then we looked at the weak links in all his communications networking, we took out radio towers, we took out a fibre-optic link. A fibre-optic link is as thick as your hand but we knew that it lay across two bridges so we thought if we took the bridge down the fibre-optic cable goes with it. We had to think right down to that sort of detail. That is where the INTEL targeteers came in because they had that sort of knowledge. We found that at the operational level you had to really get down to the weeds to think the process out to decide what had to be done.

Once we'd gone through the thinking processes of identifying the best way to achieve our objectives in a priority order, we had to have a look to see whether we could actually do it. We said, 'All right, what have we got, what assets do we have, what weapons do we have?' That's where we did a little bit of target-to-weapons matching analysis. We went through the targets and said look this is the target, this is the type of destruction needed and then we pushed it off to the Target Selection Group and they came back and said yes we can do this, we can do that, no we can't do that. That changed our thinking a little bit. Piece by piece we came up with that whole thinking process in the BMG.

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The last thing I would give the Battle Staff meeting would be guidance on what my priorities were for the next twenty-four hours for the planning process, being mindful that you've got to think three days in advance. I'd say, 'Right, I want to concentrate on the air defences or I want to take on a little more of the interdiction work'. I'd give the BMG broad guidance.

That was the initial methodology of how we tackled it, and built the tenday plan. Then we'd give it to the Battle Management Group and they'd go with the Target Selection Board who worked very closely with them. They'd⁷ go away and select the targets, the recce sites and the attack concept, and they'd do a little bit of weapon matching and analysis to say yes we have the capability. They'd come up with targets in an order of priority and the necessary level of damage. Identifying the 'what' <u>not</u> the 'how'. They'd done a little bit of analysis behind the scenes on the 'how' but we've got to do that to determine whether we can do it. My aim was to give them [82WG] an ATD that was capable of being achieved. It's silly to give somebody a task when you know damn well he hasn't got the resources to do it.

Then we came to developing the ATD schedule and what we'd put in it. Originally we'd decided to issue the ATD at 1700 hours but I brought that forward to 1500 because I was conscious of the fact that if we put something out today, the corresponding tasking order goes out tomorrow for flying the day after, the reaction time is virtually 48 hours. I mean to get something off you've got to give air crew enough time to do some mission planning. It doesn't have to be 24 hours, it can be six hours if necessary but you've got to give them some time to think, to do the analysis and give the support staffs in the squadrons be they intelligence, be they weapons loading crews time to react to get the package together. You've got to know the procedures involved so you can tell somebody what to do and be assured that when you tell him what to do, the only things that can go wrong in fact are either systems failures, enemy action or human error.

[TRAMOUNDANIS] Was there any level of interaction between your headquarters and 82WG in developing the ATD?

[ROGERS] Initially no, but after the cycle kept going, yes. And I'll explain that. The ATD did change a little bit. We'd have the Battle Staff meeting then the BMG and then the target group got together and then they gradually built up the ATD. They'd come back to me at about 1300 hours.

The TSB.

For training purposes, I'd been involved in the process all along, and we'd have a look at the skeleton ATD with the aim of getting it out at 1500 hours daily. Now the idea is at 1500 the ATD gets on the wire up north; that's not for next day operations, but for those of the day after. They [82WG] aimed to get their ATOs out at 1200 and 1600 hours for the next day's day and night waves, respectively. With a 24 hour rolling process, those times are flexible and, towards the end, Dunlop said that we could probably reduce that time-frame. So after getting the ATD out each day at 1500, the BMG would start the generation process all over again. I used to have another Battle Staff meeting just with the core Battle Staff at 1930 hours where we'd review the missions of the afternoon. By that time, the first wave would be back, we'd have a look at the results and any other information we had, knowing that the night mission was just getting air borne. Then we'd come back in the morning and start the whole process again. We'd have people on stand-by over night going through and putting it all together for the briefing at 0730 hours in the morning. That was the rolling process.

I think we did a reasonably good job in getting the ATD out. I'll let Group Captain Dunlop get on to what was done at the other end; I don't want to pre-empt what he says in that sense. Coming back to our side, it's very important that you involve all the people in the headquarters, as I said. People like the legal officer. She was very heavily involved in both the BMG and also the Target Selection Board looking at the legality of attacking the targets we selected and the weapons we used against them, looking to limit the collateral damage which we were not only obliged to do by the Geneva convention but it was also a requirement of the pseudo-CDF directive, and of the Air Commander himself. The legal officer also looked after a lot of things on Rules of Engagement. We found that the Rules of Engagement we were given initially were virtually unlimited. I backed off a little bit and issued another set as I was playing the Air He still has the authority to issue Rules of Commander per se. Engagement providing they're more restrictive than those issued by higher authority.

[TRAMOUNDANIS] The Air Commander may issue ROE?

[ROGERS] More restrictive ones, yes. If you wish to exceed your level of authority then you've got to go up the line and put a ROE request in. But what I used to do is come up with a new, more restrictive set of Rules of Engagement which would suit the targets, the mission and the objectives we were going for that day. At the same time I'd issue them, I'd push a copy up stream and request concurrence. They'd come back and say yes. I'd also request concurrence if we had to go above the approved ROE level.

We also had planned covert operations which I'll cover in a second. Now on the legal side it is most important that you have someone who is au fait with all those things and can answer questions very quickly. The legal officer picked it up very well and provided sound advice.

We played the logistics side quite heavily. Aspects such as resupply of the bases, how many bombs were dropped. I needed to know what was at the bases and could be used. They used to pass back aircraft statistics, how many were shot down and so on, but I was very interested in the logistics support - for example the fuel stocks. I would say, 'The fuel stocks are getting down; don't let them get below a certain level', and the logistician would fix it. We had a look at the rations, we had a look at the bomb stocks, the weapons store, etc and if they were a bit low I'd say, 'I don't want it to go below a certain level'. I had no way of knowing what weapons they'd choose, but knowing the capability of our weapons and weapons systems we had a reasonable idea as to what they'd employ. When the daily usage would come back we had an indication of how they were thinking. We really didn't have to bother them saving what weapons We were making judgements for them and are you going to use. prepositioning adequate weapons stocks there. We had to consider putting contingency stocks at all the airfields. If aircraft deployed, if Darwin was closed, the Singaporean aircraft had to operate out of Curtin or some of the Marines had to move. So, in theory, we positioned some other stocks at Curtin. Thinking through that process and getting the young officers involved in that process was important. Fuel was very important because it has significant repercussions; where does the fuel come from, does it come from Singapore, does it come from Perth? A real live one, for example, was when the Marines didn't come, they had to turn off a tanker from Singapore; we just didn't have the capacity of storing that fuel. That was very good experience for them.

On the Curtin side, we didn't get involved in the ground war at all. On covert operations, I got them to do a little psychological warfare which I don't think had been done in PITCHBLACK before, minor as it may seem. I wanted a leaflet drop over Tindal with a Herc at night time. We put together some propaganda type letters to various people on the base, we had names, making sure that nothing went overboard in terms of writing about girlfriends when fellows were married. Common sense applied. Some of them got the letters and laughed at them. Some of them brought the letters in. During the leaflet drop some fell on the base and some fell on the civvy side. There was an incident where Blue came back and doctored the leaflet and put it up under a legal context but we had evidence to say what we'd dropped. But we [the RAAF] don't get involved in psychological warfare. The army does quite a lot, we've got to consider it too not only just the offensive actions. You've got to consider the psychological side as well; you try and persuade, dissuade, convert, divert call it what you like, and that's got to be done at this level. Covert operations were not put in the daily ATO for the simple reason of security. They were put down by another net. I was only given access to those assets on certain nights, they were controlled by somebody else on the other nights.

Command and control came into it a little bit because there was a bit of a mix up in that the Herc was under OC82WG operational control, yet it was being tasked by somebody else. He, OC82WG, said 'Hey you've got to bring it back into the net and I've got to know what's going on if their under my OPCON'. I said, 'I heartily agree' and we addressed that. But that whole picture has got to be known by the Air Component Commander, or the Joint Force Commander, or the Naval or Land Component Commanders. They've got to know the big picture because we could be doing something which could completely blow an operation that somebody else is doing. So the big picture is very important. As part of the covert operations we had C130s going into dirt strips simulating offloading people to go do something like cut a cable and recover the next night or let them wander off into the bush and join up with phase three [the ground offensive] into Curtin. We developed all those sorts of activities. Mainly to get the younger staff officers thinking about all types of operations and the processes involved in putting them in place.

As to simulated targets, I know it has very little to do with operational planning, after we put the ATD out they had this team move around the bush build the target and it would be there the next day. Really I don't think it's practical for the time taken. We need to build targets up there first, leave them there and pull them down later on. We just didn't have the time or the resources to do that. What the team did was quite good, very rudimentary, but nevertheless I think it's got to be pre-planned a little bit better than we did this time.

When the ball started rolling we found that we were putting out a tasking directive on, say, Monday for our attack on Wednesday. Then on the first couple of days we said OK if you don't get the targets, these are the priorities if you've got to go back again. That was a bit loose. We were telling them [the tactical level] what to do and were giving them a lot of latitude as to what target they selected. We found that what we were trying to achieve by a certain day was not getting done and by the time we got the feedback we were 24 hours behind the eight-ball. So after a while we put the targets into a series of types, what I call baskets of targets.

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They included for example Presidential targets, they were the ones where we were directed to attack at all cost. Even though I might threaten to resign! You always find those sorts of things where somebody will get a bee in his bonnet saying, 'I don't give a damn what you do in your campaign planning down there I'm speaking from up here, you do this'. Now sometimes that's just pigheadedness, but sometimes there's a very good reason. To avoid conflict and confusion you've got to be in the big picture. Now it may be a Prime Ministerial directive come down to do it but with that directive has got to come down the reasons why things are being done because we may be doing something completely contrary. So that's why I'm saying the Commander of the Battle Staff has really got to know and be in the big picture at all times. For example, there was an armoured column coming up from the south and I said, 'I can't be diverted from an air defence task for an armoured column as they won't have any effect at all on our operations for at least a week. If I divert my assets it means I can't get the job done'. They⁸ came back and said, 'Do it'. I went back and said, 'No. I disagree with it whole heartedly and I'll resign'. They said, 'No, its a Prime Ministerial direction because they think there are some heavy heads on board'. But if they'd said that in the first place I would have said I could divert some assets to do that. You've got to keep people informed all the time. So Presidential targets were something we didn't have any say in. The next 'basket' was the air defence system targets and then there were the interdiction targets. So we had virtually three baskets and after a week we used to prioritise the targets within these baskets. For example, I'd say, today 40% of your work is supposed to be against air defence targets. The Wing would go to the air defence basket, and pick the targets in the assigned priority order then OC82WG would figure out how he did it, it was up to him.

[TRAMOUNDANIS] How did you decide on the apportionment?

[ROGERS] Using a basis of 100 %, we looked at the capabilities of all the assets; for example the F5s and the F16s as they were only offensive counter-air, they had to stay in that 'basket' all the time. The tankers could only do tanking, the E2 could only do surveillance, they were fixed. For the rest we worked out percentages, namely looking at the objectives I was given to degrade the air defence system and then to carry out interdiction before the ground offensive. Initially Offensive Counter Air against air defence targets was very high and interdiction was low and then the latter slowly increased as the campaign changed. I was giving that guidance to the tactical level. It was somewhat of a canned program.

Higher authorities.

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If I told you to mount a maximum effort for the next six weeks, I'd say here's your apportionment. I didn't want to say to OC82WG 16 missions OCA a day or 14 missions DCA a day because that would be telling him the 'how'. All I want to tell him is the 'what'. I'd say right, here are my priorities, the priority at this particular stage is air defence, I'd have to show that in the apportionment of his effort, it's not the apportionment of forces, it's the apportionment of his effort. I guess about 50% was set anyway by the available assets. The rest was flexible and accorded with the priorities we came up with in the Battle Staff that day. As the campaign progressed, the interdiction slowly increased in priority because we had to take out bridges to stop the army who were coming in. That all came into the intelligence picture as we were building it up. Some people had the idea that apportionment was going to be the number of missions. No. Its apportionment of effort, it's a guide to him. And then we had to adjust the structure of the ATD to fit the 'target baskets' arrangement because we weren't giving that in the first cut we made. We had to learn. It was an evolving campaign planning process, as was the development of the ATD.

Now, the process, I know there was a sort of controversy why we were putting out an ATD and not the ATO as the Americans did in the Gulf War. There's arguments for and against that. But if we're going to try and stick to our doctrine, we must do some operational level planning and some tactical level planning, you've really got to separate the two. Whilst they're linked, if you let the tactical commanders take over the whole thing, you lose sight of the big picture because their fingers are too far down in the mud. We could have gone and just given them the directions and just said here's the general directions; air defence, interdiction, go to it. But then they have to go through that thinking process at their level and that's not their job. It was a combined effort this time. It was relatively small compared to the Gulf and they had not only the requirement to figure out 'how' they had to do the route deconfliction and also had to task the tankers and the other tactical details.

One question is should the operational level staff have been in theatre. I think that was one of the things that came out of the Gulf War where Schwarzkopf said 'You've got to be in theatre; you know what's going on, you're under the same pressure'. I don't have any hassles with that. However I think the HQs have to be separated because if you're in the same building you're all doing the same thing and I would get too much involved in the weeds and they'd get too much involved in the upper level. So you've really got to be separated. Then comes the question what if it's ten miles or a thousand miles? If you've got good communications, good

video everything like that, then perhaps distance may be irrelevant. Schwarzkopf has a point though.

[TRAMOUNDANIS] I think in our case ASMA introduced some constraints in communications.

[ROGERS] It is very limited. If we had something similar to the American system, CTAPS, we'd be better off. They've got the capability built-in and it's used all round the place. ASMA worked but it was slow. The Brits made it work in the Gulf. We should have a look how they made it work because we need to improve its ability and accessibility.

[TRAMOUNDANIS] I was interested to note you have the Desired Mean Point of Impact, the DMPI, as one of the entries in the ATD.

[ROGERS] That was the result of the level of major target analysis that we had to do to save HQ 82WG a little bit of work up their end. They had to do the target-weapon matching, but it gave them a bit of guidance as to where to go. For example if the target was an underground bunker we'd done all the analysis. We had the necessary information for example, how far underground, how thick are the walls, how big is the over-burden, what over-pressure do you need, all those sorts of things. From the analysis you might find that, if you put the weapon in the shaft in the middle that would do the maximum damage. So we can put apportionment percentage and say the DMPI is the shaft. I think it was a sensible inclusion in the ATD.

[TRAMOUNDANIS] Were you second-guessing their weapons choice?

[ROGERS] In some ways you probably are, but nevertheless he [OC82WG] had a range of weapons in the inventory he could have had a go with. He had several PGMs, not only GBU 10s and 12s. The Americans had a few more weapon types and so he had a range available. There was some latitude. I'm not telling him exactly what to do. Weaponeering was really only done for some major targets, not all of them. When they were told to take out a tower for example, they'd figure it out; that's only a minor But we worked on the major targets that really had to have target. precision weapons. So that they could say, 'We know the DMPI, what's the best weapon to take it out?' And they'd say, 'Right, have a look through the manuals quickly, ah, it's probably a GBU-15' OK we can carry that, on an F111', or vice versa. We tried to help out like that to make sure that he [OC82WG] wasn't burdened with analytical problems to slow his decision making processes down.

We could have put in some artificial constraints but Exercise Control chose not to do that. It wasn't really free-flowing in many ways, it was a canned exercise from the flying program aspect and the timings etc. Air traffic restrictions and limitations made by the participant nations did impose quite a bit of constraint. Not on *our⁹* planning but on how OC82WG performed his tasks. We, at the operational level, didn't pay much attention to that but he had to. I didn't get into how he put his tasking orders together. I might have played it a different way, for example with all the assets he had, Group Captain Dunlop tended to work a package system known as the big gorilla; although he did not have any SEAD or OCA. On the other hand, I may have used dummy packages and perhaps single F111s at night time. And all different routes. That's just a difference of opinion on the tactical use of air power.

Have you got any other questions at all?

[TRAMOUNDANIS] Yes I've got a couple of questions. Why didn't ACAUST play your role? Was it because it was only a strike exercise?

[ROGERS] He was controlling the entire exercise and as such was also acting as the National Air Defence Commander. It's a bit artificial to play the lead in both Orange and Blue camps simultaneously. In addition, he also had a lot of VIPs to host, all of whom came to have a look at how it was being done.

[TRAMOUNDANIS] How did COPS fit into the Battle Staff?

[ROGERS] He didn't because he was the Exercise Director and had the overall supervisory role. He also controlled the scenario development through EXCON, or exercise control.

[TRAMOUNDANIS] How would he normally fit in?

[ROGERS] He would be on the Battle Staff. Normally on the Battle Staff we would have the ACAUST, the four FEG commanders, the Chief of Operations and the Battle Staff XO who is the coordinator: that would be it, full stop. Then you would have all the Branch heads and the legal adviser, and the specialists sitting in the background. ACAUST would work through each of his FEG commanders and that's for complex contingencies. If you don't need one of the FEGs, that Commander is not involved; you build up the Battle Staff as you need it. This was a strike

Air headquarters.

one and, in this case, we had an adviser from TFG who would assist the BMG on how we would best use the OCA assets. You use the experts not the generalists.

[TRAMOUNDANIS] So if we had to describe COPS role, what would it be?

[ROGERS] Well he's the coordinator of all the operations and the staff in headquarters. CSPT is a new role and in the post-exercise comments I left down there, I said CSPT shouldn't be a member of the Battle Staff. He is one of the senior staff advisers. Whoever we have on the Battle Staff itself should be capable of injecting some thought on operational matters. That is not to denigrate the logistics and support functions but their role is to support the operational activities.

COPS is pretty important because he knows how the headquarters and all C^3 and the supporting elements work. For example ALG is expert in ALG, I'm strike, MPG is MPG, COPS has really got his fingers in a lot of pies and he knows how the staff system works and how the branch advisers can work as a team to support what the Battle Staff is doing. He uses his expertise, and normally COPS is an ex-FEG Commander anyway. I think that's essential that he should be. If so, he would have had experience as a FEG [Commander] working the Battle Staff procedures before his appointment as COPS. Then he should be running the Battle Management Group, as I see it.

As far as the sub-groups are concerned, I mentioned in the post-exercise notes that I left with Mike Nixon, for example, I would say that CDRSRG should be running the Target Selection Board or getting involved in it because of his expertise and experience. Rather than just being somebody who joins the Battle Staff twice a day, CDRSRG should be used during the day as well. Sure, he's directing things but he's part of the team. BMG is important and if you push it down to too low a level a FEGCDR's presence may inhibit some people from bringing out their ideas. That's what I'm worried about. Some people see an Air Commodore and they're not game to say anything. In the environment of campaign planning you can't afford that. You've got to have people there who are willing to speak their mind and say what they think because that's the only time you're going to get all the information out onto the table, stir it around and come out with the best result.

[TRAMOUNDANIS] As a group commander sitting on the Battle Staff, not necessarily in the exercise scenario, what would be your relationship with your Wing Commander (OC82WG) out in the field? **[ROGERS]** Out in the field? I would talk to him probably three or four times a day.

[TRAMOUNDANIS] Would you have any residual command authority over him?

[ROGERS] That point came up. I'm still the man. Now the point is to whom does my Wing Commander report? I still have command authority, that hasn't been taken off me. He may be under operational command, but he's still under my command. If something goes wrong up there, the Air Commander doesn't kick straight down the line at him, I get the boot in the back side. Because it is my responsibility. However, I am not going to interpose myself in the chain of command that comes out from that group called the Battle Staff and the ATD. During PITCHBLACK'94, my staff at AHQ talked to 82WG asking how things were going. I had several videoconferences daily with OC82WG to discuss a range of topics. But I didn't tell him at all how to do things. I'd say, 'Are you happy with the ATD? How's it going? Have you got any problems?' He'd pass things back and he'd say, 'You put this on, can you put that on'. And I'd say, 'Yes I can fix that'. It was very much like the team arrangement that we've got here at Amberley.

AIRCDRE Bowden raised the point of command.¹⁰ He asked, what happens for example, when he goes up there (AHQ) does he give up his command. I said, 'No you don't'. I'm perhaps a little bit different in my FEG because I'm the completely deployable FEG. If we deploy somewhere, 1SQN is going in toto. 6SQN would probably go in toto unless we've got priority training back here [Amberley] in which case we'd deploy the recce element, all of 1SQN, and all of HQ 82WG. The only people back here may be 6SQN Training Flight doing conversion/refresher training. In this case, the wing and all the squadrons are still under the command of OCWG, and in turn, under my command. But when I go to the Battle Staff, I don't abrogate my command responsibilities. I'm still responsible - but I sit on the side. In other words, it's just not taken away from me because I'm now a member of a group called the Battle Staff. I recall CDRTFG had a slightly different view and perhaps in a doctrinal sense we need to clarify this point.

[TRAMOUNDANIS] Would you agree with General Horner's description of 'nose in hands out'?

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Air Commodore Bowden is Commander Tactical Fighter Group.

[ROGERS] Yes, dead right. Dead bloody right, and like him we found exactly the same thing. That's why I brought it back to square one and distinguished between the 'what' and the 'how'. That's the dividing line. It's really pretty clear if you do it that way. Talking to General Horner when he came down to Amberley, I had about an hour and a half with him and he related a few examples about that. He was saying how a couple of times he had to tell himself to pull his fingers out before they got chopped off because he knew he was getting too far down in the weeds. That's why I think we've really got to come to grips with this ATD and the ATO.

[TRAMOUNDANIS] What would happen to your group headquarters staff, normally, not in this exercise because in this instance you took them up to be part of the Battle Staff?

[ROGERS] I would take them there anyway.

[TRAMOUNDANIS] You would?

[ROGERS] Yes, the whole lot. That's why I purposely have only five people on my staff. Because I say the wing needs the intelligence people. All I need to run the Group here is the Wing Commander Staff Officer Strike man, the photographics specialist who does the strategic/tactical reconnaissance work and my plans. The AMO is a non-combatant member and he would probably stay at Amberley. My secretary is a civilian and she would probably stay here too. My Corporal would also come with me. That's all I need. Now I have to be augmented by the staff at Air Command, the intelligence people and the legal people because I don't have legal people nor do I need them on a day to day basis. AHQ is where you need those people. They come together and they form the team of advisers. The Wing also needs the tactical specialists, they need the planners, they need the operations guys, they need the intelligence folks and they need the logistics people. When I become involved at AHQ I am removed from the tactical planning at the Wing level. It's the OC who needs that. My idea is that they all deploy with the Wing HQ.

[TRAMOUNDANIS] OK, with the staff that you take with you up to air headquarters would they be your own personal advisory staff or would they meld in with whatever organisation is there?

[ROGERS] They meld in with the organisation and form part of the team structure. Most of them have had experience in the Wing before. More often than not my Staff Officer is an ex-CO, or as in the case of my present SO served there as the OPS officer. They know the intricacies of what Strike/Reconnaissance missions are all about. They know the types of

operations, so you put that team into the planning process and the thinking process of what we have to do. And in determining the 'what', they know damn well what the people at the 'how' level have to do.

[TRAMOUNDANIS] So I guess you'd fit them into the Battle Management Group?

[ROGERS] Yes that's right and some of the other committees/groups.

[TRAMOUNDANIS] But would they be like a pool of people, if there were multiple FEGs?

[ROGERS] Its not really a pool because we don't have strike experience down at Air Command. I have to take that down there. Same with the Maritime and the Transport Groups, we have to import. I am the Air Commander's specialist on Strike and my staff are the people supporting me. We all go down there en mass and we form the team. I sit on the Battle Staff, my SOPP and those guys would sit on the Battle Management Group, probably the Target Selection Board, etc.

[TRAMOUNDANIS] How beneficial was this experience of air campaign planning and are there any intentions to incorporate this operational level planning activity in other exercises?

[ROGERS] I'm sure the Air Commander will use the same sort of principles again. But we'll modify as we go along and learn by our mistakes. I'm doing a training program up here next Friday as a matter of fact. I've got all my crews coming to it and I've got all the information I brought back with me. I'm going to go through the same thinking process I am going through with you today. I'll tell them how the thing was all put together, what were the processes we went through and then pass it off to the Wing Commander [OC82WG] and he can give an indication of what he did so that they've got the rationale behind the whole development process. That's very important. I think in future exercises of the K series and probably the PITCHBLACKs we'll try and do this.

The main benefit was the training for the staff down there at AHQ. The looks on the staff officers' faces and all the guys down at Air Command clearly showed that they'd never seen this sort of thing before and had never been involved in those sort of thinking processes other than at staff colleges and doing OETCs and the like. They're now starting to put this sort of thing into practice and I think it was very beneficial. The learning curve was pretty steep but they really got into it. They were getting the kicks in the tail from their bosses for not doing their daily job! But I'm not worried about that. As I said to the Air Commander, they learnt more in

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the last two weeks than they've learned as far as running Air Command for a long time. Particularly as they experienced the considerations that they have to be processing through their minds, through their systems, and through their organisations, if anything came to the crunch.

[TRAMOUNDANIS] But you haven't heard of any firm plans for example to do an exercise activating more than one FEG.

[ROGERS] Well, it will probably be developed, built into the PURPLE PEREGRINE procedures, the CPXs that AHQ runs. They normally run it once a year about December. They did last time where we had a scenario involving all the FEGs, we all came down and we worked the full Battle Staff procedures. I think it's worthwhile before one of these exercises, even if it's only for three days, if we get down there and we run the CPX. That way the people who are going to be involved in it will know what they're up for. We then tell them what they've got to do is go away now and plan to divide their work-load between the day-to-day stuff and how much they're going to dedicate to the exercise. For PITCHBLACK'94 we were involved full time. Group Captain Nixon was on it full time, but most of the others we used only for about two hours in the morning; with the exception of two, the intelligence and the logistics folks, who we used for probably half a day. But still, I think that dip in the tank was very, very valuable for them. I involved them all, I asked them questions and used it as a training exercise. Having been through it before and rather than just anticipating the way things were going, I'd ask them, 'Well what do you think, what would you do in this case?'

There was one case where a question arose whether we should take something out, oh yes, it was an oil refinery. One of the limitations that we were given by the higher directive was that we shouldn't destroy the Blueland infrastructure. On this occasion the BMG and the Target Selection Board came up and said take out the Catalytic Cracking Tower of the oil refinery. I said 'No, hang on, time out'. 'Look at our Rules of Engagement, look at the guidance we've been given'. What we had to do was cut the flow of oil. I said, 'There are better ways of doing that'. Take the Gulf War situation where the Tornadoes were sent against the power stations. All they had to take out was the switching yard and that would have achieved the same thing and meant that the enemy infrastructure could be resurrected within weeks rather than years. I said, 'If we take out the Cat. Tower, that means that the whole refinery is going to be out for years'. I said, 'What we can take out is the pumping station before the oil goes to the pipeline and destroy that or destroy the electrical equipment that provides power to it or the storage tanks'. There's other ways of doing it and I said 'Taking out the Cat. Tower exceeds my

authority'. We talked about it for about ten minutes and we came down to a vote. It was about six all. Six said no, 'You're right, taking out the Cat. Tower is bad'. Others said, 'No we don't agree with you', and then the legal officer said to take out the Cat. Tower! So I said, 'No, my decision is that we won't and I'll go up the line'. So we changed to the switching yard and went up the line and they came back and said 'We direct you *not* to take out the Cat. Tower'. I used that as an example to get people to think that they just can't go out and say yes we'll bomb that we'll bomb this. We have to get them to think of and consider all the factors involved.

[TRAMOUNDANIS] Last year I think it was, Group Captain Waters and Alan Stephens put out a paper on air campaign planning.

[ROGERS] Yes I used it. To great effect!

[TRAMOUNDANIS] I was going to ask you, they had an annex in it that addressed the commander's estimate process, did you actually incorporate that into your planning?

[ROGERS] Yes. I got it, I photocopied it and I passed it around to all members of the Battle Staff and to the BMG and said, 'This is our thinking processes, its the development of doctrine'. 'I want us to use this as the guide, not as the bible, but as the guide and with all doctrine, let's be flexible'. And I did exactly that. We thought the processes through, picking the eyes out of all things because I know Gary and Al put a lot of work into it. No that was good. It was a very useful guide to us.

[TRAMOUNDANIS] Well that's all the questions I had, sir. thank you, I really appreciate the time you've given me.

BIBLIOGRAPHY

Defence Publications/Instructions

Australia

Australian Defence Force Publication 1 (ADFP 1), *Doctrine*, Edition 1, 30 November 1993.

Australian Defence Force Publication 4 (ADFP 4), Mobilisation Planning, 1993.

Australian Defence Force Publication 9 (ADFP 9), Joint Operations Joint Planning. (This publication is classified Restricted)

DI(AF) AAP 1000, *The Air Power Manual*, Second Edition, Royal Australian Air Force, Air Power Studies Centre, Canberra, March 1994.

DI(AF) AAP 1001, *The Condensed Air Power Manual*, Second Edition, RAAF Air Power Studies Centre, Canberra, 1994.

Australian Defence Force Publication 101 (ADFP 101), Staff Duties Series, Glossary.

United Kingdom

Royal Air Force Air Power Doctrine, AP 3000, 2nd Ed, 1993.

United States

Air Force Manual 1-1, Volume I, Basic Aerospace Doctrine of the United States Air Force, Department of the Air Force, March 1992.

Air Force Manual 1-1, Volume II, Basic Aerospace Doctrine of the United States Air Force, Department of the Air Force, March 1992.

Bibliography

FM 100-5, Operations, Headquarters, Department of the Army, 14 June 1993.

JFACC Primer, Deputy Chief of Staff, Plans and Operations, Headquarters USAF, 2nd Ed, February 1994.

Joint Pub 1, Joint Warfare of the US Armed Services, 11 November 1991.

War Department Field Manual 31-35 of 9 April 1942.

Defence Reports/Papers

Australia

ACOPS BQ6285/93 of 14 September 1993.

Air Board Submissions 57/67, 63/67 and 9/68.

Defending Australia: Defence White Paper 1994, Australian Government Publishing Service, Canberra, 1994.

Dibb, P., *The Strategic Priorities for Australian Defence Industry*, Report to the Department of Defence, Strategic and Defence Studies Centre, Australian National University, November 1992.

Military Working Arrangement Between Commander, United States Military Assistance Command Vietnam and Chairman, Chiefs of Staff Committee Australia Dated 30 November 1967. United States National Security Action Memorandum (NSAM) 273, 26 November 1963. Reprinted in Horner, D.M., Australian Higher Command in the Vietnam War, Canberra Papers on Defence and Strategy No 40, The Strategic and Defence Studies Centre, Australian National University, Canberra, 1986.

Ministerial Statement by the Minister for Defence the Honourable Robert Ray, 30 November 1994.

Strategic Review 1993, Canberra, December 1993.

United States

Cohen, E.A., Gulf War Air Power Survey, Vol II, Operations and Effects on Effectiveness.

Keaney, T.A., and Cohen, E.A., Gulf War Air Power Survey Summary Report, Washington DC.

United States Department of Defense, Conduct of the Persian Gulf War; Final Report to Congress Pursuant to Title V of the Persian Gulf Conflict Supplemental Authorisation and Personnel Benefits Act of 1991 (Public Law 102-25), Washington, DC, Department of Defense, April 1992.

United States Department of Defense, Critical Technologies Plan, Washington, DC, 15 March 1990, 1 May 1991.

United States National Security Action Memorandum (NSAM) 273, 26 November 1963. Quoted in Clodfelter, M., *The Limits of Airpower - The American Bombing of North Vietnam*, The Free Press (New York), 1989, pp 40-42.

United States National Security Action Memorandum (NSAM) 288, 16 March 1964, Memorandum by Secretary of Defence Robert S. McNamara to the President. Quoted in Clodfelter, M., *The Limits of Airpower - The American Bombing of North Vietnam*, The Free Press (New York), 1989, pp 40-42.

Books

Adan A. (Bren), On the Banks of the Suez: An Israeli General's Personal Account of the Yom Kippur War, Arms and Armour Press, London, 1980.

Armitage, M.J., and Mason, R.A., Air Power in the Nuclear Age, 1945-84: Theory and Practice, The MacMillan Press Ltd, 2nd Ed, 1985.

Atkinson, R., Crusade: the Untold Story of the Persian Gulf War, Houghton Mifflin Co, New York, 1993.

Bergquist, R.E., *The Role of Air Power in the Iran-Iraq War*, Air University Press, Maxwell AFB, Alabama, December 1988.

Blinding Weapons, Reports of the Meetings of Experts Convened by the International Committee of the Red Cross on Battlefield Laser Weapons, 1989-1993, ICRC, Geneva, 1993.

Clausewitz, C. von., On War, (Ed and Trans) Howard, M. and Paret, P., Princeton University Press, 1984.

Clodfelter, M., The Limits of Airpower - The American Bombing of North Vietnam, The Free Press, New York, 1989.

Coulthard-Clark, C.D. *The Third Brother: The Royal Australian Air Force* 1921-39, Allen & Unwin, in Association with the Royal Australian Air Force, 1991.

Craven, W.F. and Cate, J.L. (Eds), *The Army Air Forces in World War II*, *Volume II*, *Europe: Torch to Pointblank - August 1942 to December 1943*, The University of Chicago Press, 1949, New Imprint by the Office of Air Force History, Washington DC, 1983.

de la Billiere, P., Storm Command: A Personal Account of the Gulf War, Harper Collins, London, 1992.

Douhet, G., *The Command of the Air*, (Trans) Ferrari, D., Office of Air Force History, Washington DC, 1983.

Dupuy, T.N., *Elusive Victory: The Arab-Israeli Wars 1947-1974*, MacDonald and James, London, 1978.

Emme, E.M., *The Impact of Air Power: National Security and World Politics*, D. Van Nostrand Company, Inc., Princeton, New Jersey, 1959.

Futrell, R.F., *The United States Air Force in Korea*, Revised Edition, Washington DC, Office of Air Force History, 1983.

Handel, M.I., Masters of War: Sun Tzu, Clausewitz and Jomini, Frank Cass & Co Ltd, 1992.

Hastings, M., Bomber Command, London, 1987.

Horner, D.M., Australian Higher Command in the Vietnam War, Canberra Papers on Defence and Strategy No 40, The Strategic and Defence Studies Centre, Australian National University, Canberra, 1986.

Jomini, A., Baron de, *The Art of War*, (Trans) Mendell, G.H. and Craighill, W.P., Greenwood Press, 1977.

Liddell Hart, B.H. (Sir), Paris or the Future of War, Kegan Paul, Trench, Trubner & Co Ltd, London, 1925.

Mackenzie, S.A., Strategic Air Power Doctrine for Small Air Forces, Air Power Studies Centre, RAAF, Canberra, 1994.

Mitchell, W., Winged Defense: The Development and Possibilities of Modern Air Power - Economic and Military, Dover Publications, New York, 1988.

Momyer, W.M., Air Power in Three Wars (WWII, Korea, Vietnam), Department of the Air Force, Washington DC, 1978.

Narayan, B.K., Lessons and Consequences of the October War, Vikas Publishing House, New Delhi, 1977.

Odgers, G., Air War Against Japan 1943-1945, Australian War Memorial, Canberra, 1957.

Orange, V., Coningham: A Biography of Air Marshal Sir Arthur Coningham, KCB, KBE, DSO, MC, DFC, AFC, Methuen, London, 1990.

Overy, R.J., The Air War 1939-1945, Papermac, London, 1980.

Paret, P., Makers of Modern Strategy: from Machiavelli to the Nuclear Age, Princeton University Press, New Jersey, 1986.

Quester, G.H. Deterrence Before Hiroshima, Wiley, New York, 1966.

Shultz, R.H., and Pfaltzgraff, R.L. (Eds), The Future of Air Power in the Aftermath of the Gulf War, Air University Press, Maxwell AFB, Alabama, July 1992.

Schwarzkopf, H.N., with Petre, P., It Doesn't Take a Hero, Linda Grey Bantam Books, 1992.

Stephens, A. (Ed), Defending the Air/Sea Gap: Exploiting Advanced Technology and Disproportionate Response to Defend Australia, Australian Defence Studies Centre, Canberra, 1993.

Stephens, A. (Ed), The War in the Air 1914-1994, Air Power Studies Centre, Canberra, 1994.

Strachan, H., European Armies and the Conduct of War, George Allen & Unwin, London, 1983.
Sun Tzu, The Art Of War, (Trans) S.B. Griffith, Oxford University Press, 1971.

Terraine, J., Right of the Line, Hodder and Stoughton, London, 1985.

Tilford, E.H., Setup: What the Air Force Did in Vietnam and Why, Air University Press, Maxwell AFB, June 1991.

Warden, J.A., *The Air Campaign: Planning for Combat*, National Defence University Press, 1988.

Westmoreland, W.D., A Soldier Reports, Doubleday & Co, New York, 1976.

Winnefeld, J.A. and Johnson, D.J., Command and Control of Joint Air Operations: Some Lessons Learned from Four Case Studies of an Enduring Issue, RAND, Santa Monica, 1991.

Winnefeld, J.A., Niblack, P., and Johnson, D.J., A League of Airmen: U.S. Air Power in the Gulf War, RAND Project Air Force, Santa Monica, 1994.

Wolstenholme, E.F., System Enquiry: A System Dynamics Approach, Wiley, Chichester, 1990.

Journal Articles/Essays/Theses

Aviation Week and Space Technology, Editorial, 'US Demonstrates Advanced Weapons Technology in Libya', 21 April 1986, pp 19-20.

Bailey, L.M., 'The Medium Power Airforce - What Need to Exist?', Defence Force Journal, No 83, July/August 1990, pp 51-58.

Datuk Ahmad Merican, 'The Malaysian View of the Regional Cooperation prospects', in Coulthard-Clark, C. (Ed), *The Qualitative Edge: A Role for Air Power in Regional Co-operation*, Air Power Studies Centre, Canberra, 1993.

Dibb, P., 'Australia's Regional Security policy in the 1990s', in Coulthard-Clark, C. (Ed), *The Qualitative Edge: A Role for Air Power in Regional Cooperation*, Air Power Studies Centre, Canberra, 1993.

Dick, R., 'Confronting Complacency: The RAF Girds for War, 1933-1939', *Air Power History*, Vol 41, No 1, Spring 1994.

Doerner, W.R., 'In the Dead of Night', Time, 28 April 1986.

Earle, E.M., 'Influence of Air Power', in Emme, E.M., The Impact of Air Power: National Security and World Politics, D. Van Nostrand Company, Inc., Princeton, New Jersey, 1959.

Freedman, L., and Karsh, E., 'How Kuwait was Won', International Security, Vol 16, No 2, Fall 1991.

Horner, C.A., 'New Era Warfare', in Stephens, A. (Ed), The War in the Air 1914-1994, p 322.

Kirtland, M.A. 'Planning Air Operations: Lessons from Operation Strangle in the Korean War', *Air Power Journal*, Summer 1992.

Krause, M.D., 'Moltke and the Origins of Operational Art', *Military Review*, September 1990.

'Less Than Lethal', International Defense Review, 7/1994, p 29.

Lewis, R.B.H., 'JFACC: Problems Associated with Battlefield Preparation in Desert Storm', Air Power Journal, Spring 1994, pp 4-21.

MacGregor, D.A., 'Future Battle: The Merging Levels of War', *Parameters*, Vol XXII, No 4, Winter 1992-93, pp 33-47.

MacIsaac, D., 'Voices from the Central Blue: The Air Power Theorists', in *Makers of Modern Strategy from Machiavelli to the Nuclear Age*, Princeton University Press, 1986.

Moore, R.N. (Lt-Gen), 'Marine Air: There When Needed', US Naval Institute Proceedings, November 1991.

Norris, G., 'USAF/Navy to Check Gulf War Weaknesses', Flight International, 18-24 September 1991, p 10.

Putney, D.T., 'From INSTANT THUNDER to DESERT STORM: Developing the Gulf War Air Campaign's Phases', *Air Power History*, Fall 1994, pp 39-50.

Record, J., 'Why the Air War Worked', Armed Forces Journal International, April 1991, pp 44-45.

Richardson, M., 'ASEAN Security Forum Takes First Small Step', Asia-Pacific Defence Reporter, October-November 1994, p 7.

Ricks, C.W., *The Military-News Media Relationship: Thinking Forward*, US Army War College, Strategic Studies Institute, 1 December 1993.

Bibliography

Romjue, J.L., 'The Evolution of the AirLand Battle Concept', Air University Review, May-June 1984, p 12.

Sink, J.T., Rethinking the Air Operations Centre: Air Force Command and Control in Conventional War, thesis submitted to the Air University School of Advanced Airpower Studies, Maxwell Air Force Base, Alabama, September 1994.

Tange, Sir Arthur, 'Defence Policy Making in Australia', in Birman, J. (Ed) *Australia's Defence*, Extension Service The University of Western Australia, 1976.

Tirpak, J., 'The Secret Squirrels', Air Force Magazine, April 1994, pp 56-60.

Warden, J.A., 'Employing Air Power in the Twenty-first Century', in Shultz, R.H. and Pfaltzgraff, R.L. (Eds), *The Future of Air Power in the Aftermath of the Gulf War*, Air University Press, July 1992.

Waters, G., and Stephens, A., *Operational Level Doctrine: Planning an Air Campaign*, Air Power Studies Centre, Paper No 18, October 1993.

Wever, W., 'Doctrine of the German Air Force' in Emme, E.M., *The Impact of Air Power: National Security and World Politics*, D. Van Nostrand Company, Inc., Princeton, New Jersey, 1959.

Wilson, A.J., 'The Future of Air Power: An Industrial Perspective', The Hawk Journal, 1993.

Conference Proceedings

Australia's Air Chiefs: The Proceedings of the 1992 RAAF History Conference, RAAF Air Power Studies Centre, Canberra, December 1992.

The RAAF in the SWPA 1942-1945: The Proceedings of the 1993 RAAF History Conference, RAAF Air Power Studies Centre, Canberra, November 1993.

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